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RAILWAY AGE

APRIL 12, 1947

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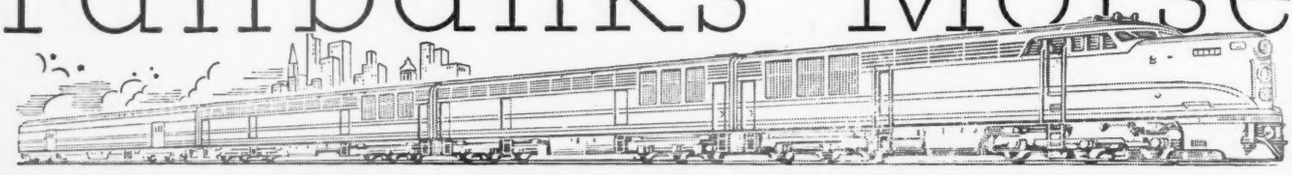
Fairbanks-Morse



TWO MORE DIESEL LOCOMOTIVES TO KANSAS CITY SOUTHERN

Delivery by Fairbanks-Morse Gives Railroad Two Complete 6,000-Hp. Locomotive Units

The wide flexibility and reserve power of Fairbanks-Morse diesel road locomotives were graphically shown in a recent step taken by the Kansas City Southern Railway. After discovering that a giant 8,000-hp. locomotive, delivered earlier by Fairbanks-Morse, was more than meeting its load requirements, the railroad purchased two additional 2,000-hp. Fairbanks-Morse diesel road locomotives. These two units were combined with the four units from the former 8,000-hp. locomotive, to make up two locomotives of 6,000-hp. capacity each.

The new locomotives are both "A" units—i.e., equipped with operating controls. They will comprise the front and rear sections of one of the 6,000-hp. locomotives. One "B" unit (containing supplementary power plants but no operating controls) will be taken from the former 8,000-hp. locomotive, and placed between the two "A" units. Thus, the 8,000-hp. locomotive will become a 6,000-hp. locomotive. With both of the 6,000-hp. locomotives having cabs at each end, it will be possible to reverse their direction without resorting to turntables.

Power is supplied, as on all Fairbanks-Morse diesel locomotives, by the "opposed-piston" diesel engine. This engine differs from the conventional diesel in that combustion takes place between two pistons within the cylinder, driving them apart by a central explosion. There are no cylinder heads, no valves, no valve-activating mechanisms. Compactness, simplicity, and economy of operation are major advantages of the opposed-piston diesel. With a minimum of moving parts to wear or require adjusting, maintenance work is thus kept to a minimum.

There are numerous construction and design features in the new diesels, not the least of which is the exclusive use of fabricated trucks. Only Fairbanks-Morse diesel locomotives are equipped with fabricated trucks throughout.

This year Kansas City Southern Railway is observing its fiftieth year of service between Kansas City and the Gulf of Mexico at Port Arthur, Texas. An accelerated program for more business is the result of plans formulated by their directorate, under the aggressive leadership of W. N. Deramus, president of the system since 1941. The two new diesel locomotives will play a vital role in helping to make the program a success. *Fairbanks-Morse: a name worth remembering.*

FOR FURTHER INFORMATION ON FAIRBANKS-MORSE DIESEL LOCOMOTIVES, PHONE, WIRE OR WRITE RAILROAD DIVISION, FAIRBANKS, MORSE & CO., FAIRBANKS-MORSE BLDG., CHICAGO 5, ILLINOIS

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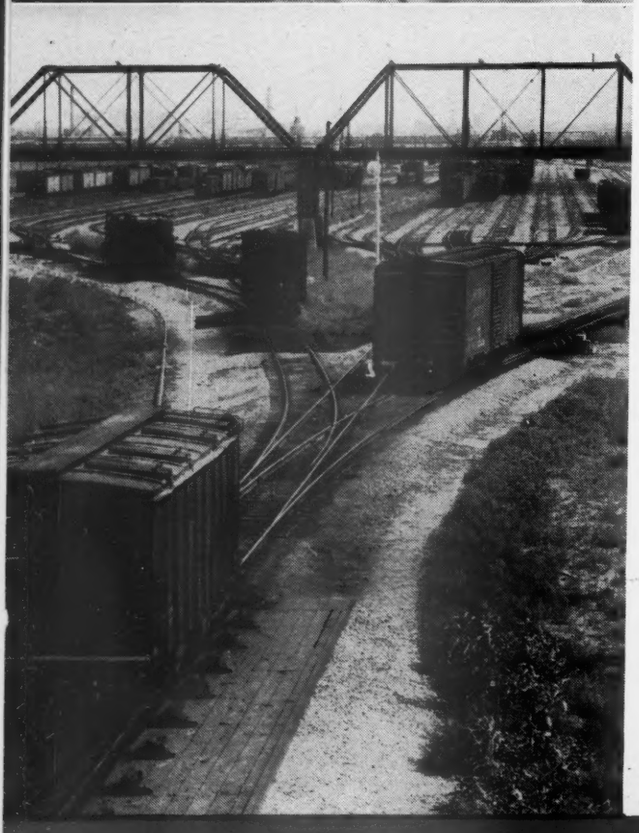
How to *SPEED* FREIGHT and *CUT* CLASSIFICATION COSTS



TODAY, they're moving freight trains over the Chicago-Denver line of the "Burlington" faster and more efficiently than ever before. Powerful Diesel locomotives, excellently maintained road, gentle curves and easy grades, 500 miles of C.T.C., and the remainder of the line double-tracked, are all good reasons behind fast freight delivery . . . So are the "Union" Electro-Pneumatic Car Retarders in three strategic yards. They protect the gains made by those other facilities—afford specific advantages of their own!

"Union" Car Retarders serve east-and west-bound yards at Galesburg—and a third yard at Lincoln. Classification delays and congestion have been eliminated. Cars move swiftly over the hump. "Specials" are accepted promptly—readied quickly for departure. And every retarder advantage holds good regardless of traffic peaks or weather. Their overall efficiency smooths the peaks—their simplicity and dependability completely overcome manpower shortages and reduced efficiency, which always accompany bad weather in non-retarder yards.

Thus, the "Burlington" strengthens its competitive and economic positions—giving shippers fast, dependable freight service—slashing classification costs—increasing rolling stock availability! How about your railroad? Bulletin 155 tells the complete story. Write for it.

UNION SWITCH & SIGNAL COMPANY

SWISSVALE PENNSYLVANIA

NEW YORK CHICAGO ST. LOUIS SAN FRANCISCO

RAILWAY AGE

Railroads Need Help from the Supply Industry

Both the railroads and the manufacturers of railway materials are this paper's customers; naturally we want to be helpful in every possible way to promote harmony in their relationships with each other. When we hear how the supply side of the business might make at least some of their railroad customers feel more kindly toward them, it is our duty to both sides to pass the word along. The word is this: Some railroad executives believe the manufacturers who sell things to them might be participating rather more aggressively than they are in promoting greater public appreciation of the railroads' needs for larger net earnings.

Government Ownership No Chimera

Evidence of the existence of this opinion on the part of railway management came to light in the spirited address of President W. G. Vollmer to the Western Railway Club on February 17, which was directed primarily to supply manufacturers. He invited his audience to help the railroads in putting "the facts of subsidized competition before the people." He then presented some statistical information indicating the degree of such subsidization, particularly of air and barge transportation, and urged that the supply industry, among other things, "organize your respective companies into an association, suitably staffed, to direct the work of fully informing the general public and the legislators . . . of the iniquitous inequality which exists in transportation and the kind of legislation needed to correct it."

Another railroad chief executive has made known to us his views on this subject, in substance, as follows:

"Along with spring comes the influx of corporate annual reports, making possible a comparison between the earnings of the railroads and those of manufacturers whose business is largely that of railroad suppliers. In 1946 the railroads handled the largest volume of freight business in any peacetime year, and earned only 2¾ per cent on their depreciated investment in plant, property and equipment; less than 3¼ per cent on the Interstate Commerce Commission's valuation of the railroads for rate-making purposes; and only 2¼ per cent on this valuation after eliminating carry-back tax credits. Even during the peak war years, railroad earnings averaged only 4.2 per cent. Herein lies the reason for poor railroad credit and inability to raise equity capital. Inherent in this situation is the danger of government ownership, because, if an essential industry cannot be sustained by private capital, government will be forced to intervene.

"Railroad suppliers should make up their minds whether they would prefer to sell to railroads under private ownership or government ownership. If the latter alternative is not attractive to them, then many railroad executives wonder why they do not become more concerned in defending what they believe in. The Railway Business Association does not appear to interest itself in such questions, and yet many leaders in the supply industry take no action individually along these lines because they evidently believe it is the duty of the R.B.A. to take the initiative. Something ought to be done to get the supply industry off dead center on this question.

"Railroad presidents see the annual reports of many industries. They note that most of them are making a much greater rate of return than the railroads are. They also note that the railroads are paying far higher price increases for the products they buy than they are getting for the service they sell. The prices and the profits of those who sell to the railroads would doubtless be viewed more sympathetically, if the suppliers were more conspicuously active than they are in helping their customers earn comparable profits. This is not an appeal to suppliers' altruism, but to their hard-headed self-interest. A prosperous customer is a better customer than one who is perennially in financial difficulties."

A Historic Parallel

An embattled institution hoping to attract allies might find some useful suggestions in reflecting upon the qualities which Britain under Churchill evidenced which were so successful to this end. When Churchill took over as Dunkirk impended, the outlook was extremely unfavorable—except that the country was plainly doing everything in its power to help itself. There was held out to a prospective ally, at least, the hope that he was being invited to side with a potential victor—from the fact that the country was showing unsurpassed unity and courage in the face of its danger, and also sufficient wisdom to entrust its fortunes to a leader of generally recognized ability. Most importantly, Britain was asking for reinforcements, not for substitutes or replacements—a distinction of great importance.

Similarly, may not the railroads expect that they also will find it increasingly easy to recruit support from the "outside" as their own campaign in behalf of preserving private enterprise in transportation grows in vigor and definiteness, and as it becomes more generally evident that they are determined to carry this fight to final victory, no matter what obstacles they may encounter? The railroad executives are on firm ground who believe the industry, in its campaign to restore to transportation sound conditions of self-supporting free enterprise, needs and deserves the assistance of all affiliated enterprises.

They have a right to expect that affiliated businesses individually or collectively will take whatever steps are necessary to make such collaboration available and effective. At the same time, nobody can supersede the railroads in the leadership of such a campaign; and the thoroughness and determination shown by the railroads themselves will doubtless set the pattern for all other participants.

Apprentice and Supervisor Training

The discussion of training mechanical-department apprentices and supervisors at the February 13 meeting of the Pacific Railway Club developed a number of interesting points, among them that, whereas some railroads are accomplishing a great deal in developing men to meet future requirements, others are procrastinating and still others have no real system at all, but depend largely upon hit-or-miss methods. The pertinent question has often been asked, whether it is consistent or logical to spend millions of dollars for new equipment and, possibly, only a few thousands for training the men who maintain and use this equipment.

On this point, it was said at the meeting that "the employment, supervision and training of apprentices are just as important as the selection, purchase and proper use of locomotives, cars and machine tools. The best possible results along these lines can be obtained only by intelligent, long-time planning and the setting up of continuous programs for many years ahead."

Recognizing the great difficulty at present, particularly in large industrial centers, of interesting the right kind of boys in apprenticeship for railway service, an earnest and persistent effort, emphasizing all of the numerous advantages of railway employment, seems necessary. There appears to be little reason for fearing that too many apprentices will be engaged, although there have been times in the past when, owing to the severe decline in traffic, some railroads were not able to place all the apprentices who graduated in some one year. On the average, however, the number of graduates has been totally inadequate to meet the demand. When it is considered that an agreed ratio of, say, one apprentice to seven mechanics is always less than the actual ratio and generally only one out of three indentured apprentices completes his course, the need for greater care in selecting apprentices in the first place and for increasing rather than lowering the ratio of apprentices to mechanics is apparent.

Apprentice graduates are or should be one of the best sources for supervisory material. Qualities of leadership are more or less inborn in men, but the right kind of an apprentice program is bound to develop such latent abilities and the records established by individual apprentices are useful in signalizing those worthy of a trial in supervisory positions.

The organized training of both apprentices and other promising employees for supervisory positions is a project of great importance. The need of each supervisor for a competent understudy is apparent, in the interest of the supervisor himself, as well as that of his employer; because the lack of such an understudy has delayed or prevented more than one promotion.

An important question of policy raised at the Pacific Club's meeting was the wisdom of the generally hard and fast departmental lines which almost preclude the possibility of mechanical officers' getting experience in other departments, and hence of qualifying themselves for higher executive positions. Where officers have talents which comprehend a wider area of usefulness than that encompassed by a single department, it is a disservice to the industry not to give these men an opportunity to qualify for duties of greater scope; and it would help the morale of mechanical-department supervisors and officers if they knew that such an opportunity was open to them.

If Good for One, Why Not for Others?

The solution of practically every problem having to do with the railroads' fixed properties involves new or additional expenditures. It is often hard to be sure whether the advantages to be expected from the installation of new devices, procedures or practices will justify the outlay; and opinions respecting specific developments vary from one railroad to another.

Consider, for example, the problem of rail corrugations. One railroad has developed elaborate grinding equipment for removing corrugations in rails, and has it in regular use on a schedule that contemplates covering all the company's important lines periodically. Its engineering officers are convinced, apparently, that the results are worth the cost. So far as is known, however, no other railroad has adopted the practice.

Then, again, there is the matter of using giant-size tie plates to protect crossties from plate cutting. One road has been using tie plates 18 in. long in certain locations for several years, and is apparently satisfied that the extra cost of such plates is justified by the advantages realized in longer tie life. There is no evidence available to indicate, however, that tie plates of this size are in use by any other railroad. Some years ago another large company, to reduce the cost of dressing ballast, developed a mechanical ballast-shaping machine and has been using it regularly ever since—but, here again, there is nothing in the record to show that any other railroad is using similar equipment.

This recitation of practices and equipment which have found acceptance on only one or a few railroads could be continued almost indefinitely. Those instances cited, are sufficient, however, to show that many railroads are still far apart in their attitude toward some developments, especially those representing a considerable departure from conventional practice. That these differences exist does not necessarily indicate that some railroads are less inclined to accept new ideas than others; it is conceivable that in such matters what is sauce for the goose may not be sauce for the gander.

It would be difficult, on the other hand, to believe that all of the numerous practices and machines that are now used by only one or two railroads, apparently

with entirely satisfactory results, are incapable of producing similar results on other roads. Perhaps the answer, in at least some instances, is an unwillingness to make the initial expenditure usually involved. Somebody, either the majority or the minority, must be mistaken about the value of some if not most of these innovations—and it would be worth a great deal to the engineering departments and to the railroad industry to determine where the error lies, and to correct it.

Achievements in Signals and Communications

A railroad communications engineer once estimated that the radio channels assigned by the Federal Communications Commission to the railroads would be worth about $12,000,000 to a privately-operated communications company. Now that fifteen months have elapsed since the assignments were made and there are but 24 railroads holding radio authorizations and 633 radio units authorized, it might appear that the railroads were not sufficiently appreciative of the allocations granted to them. It is true that some roads have hung back, preferring to avoid new responsibilities by taking advantage of what others are doing, but the record shows real achievement in the face of real difficulties.

Radio service was made available to the railroads on December 31, 1945. The first obstacle to its application was the difficulty of obtaining radio sets and accessories, such as batteries, wire and conduit. It was not until June 1, 1946, that the railroads were assured that persons operating radio sets would not have to carry an operator's license. The greatest retardant to general application which still persists is the question of satisfactory caboose power supply.

In the meantime, inductive train communication, which has been in service for a number of years, is affording the space radio field some quite healthy competition. Should there be any doubt of the quality and importance of the work done in this field, let it be noted that on April 16, 1947, the Franklin Institute will officially recognize the work done by Dr. L. O. Grondahl, director of research and engineering of the Union Switch & Signal Co. Dr. Grondahl will receive the George R. Henderson medal in consideration of his contributions over a period of years to the development which has resulted in making available a practical system of inductive train communication.

The George R. Henderson Medal Awards were founded by the Franklin Institute in 1924 and are given for meritorious inventions or discoveries in the field of railway engineering. That only eleven medals have so far been awarded indicates the careful screening and high standards maintained by the committee of awards. This is the first time this award has been made in the fields of signals and communications.

Not so long ago sensationalist newspaper and radio commentators were loudly denouncing the railroads for not using train communication, asserting that, if trains had been equipped with such devices, disastrous wrecks could have been avoided. Every railroad man knows that train communication is not primarily a safety device. It can greatly improve train performance, but it cannot indicate an open switch, an occupied track, a broken rail, and other such hazards to safety. These are the functions of the signal system and there can be no divided authority when safety is concerned.

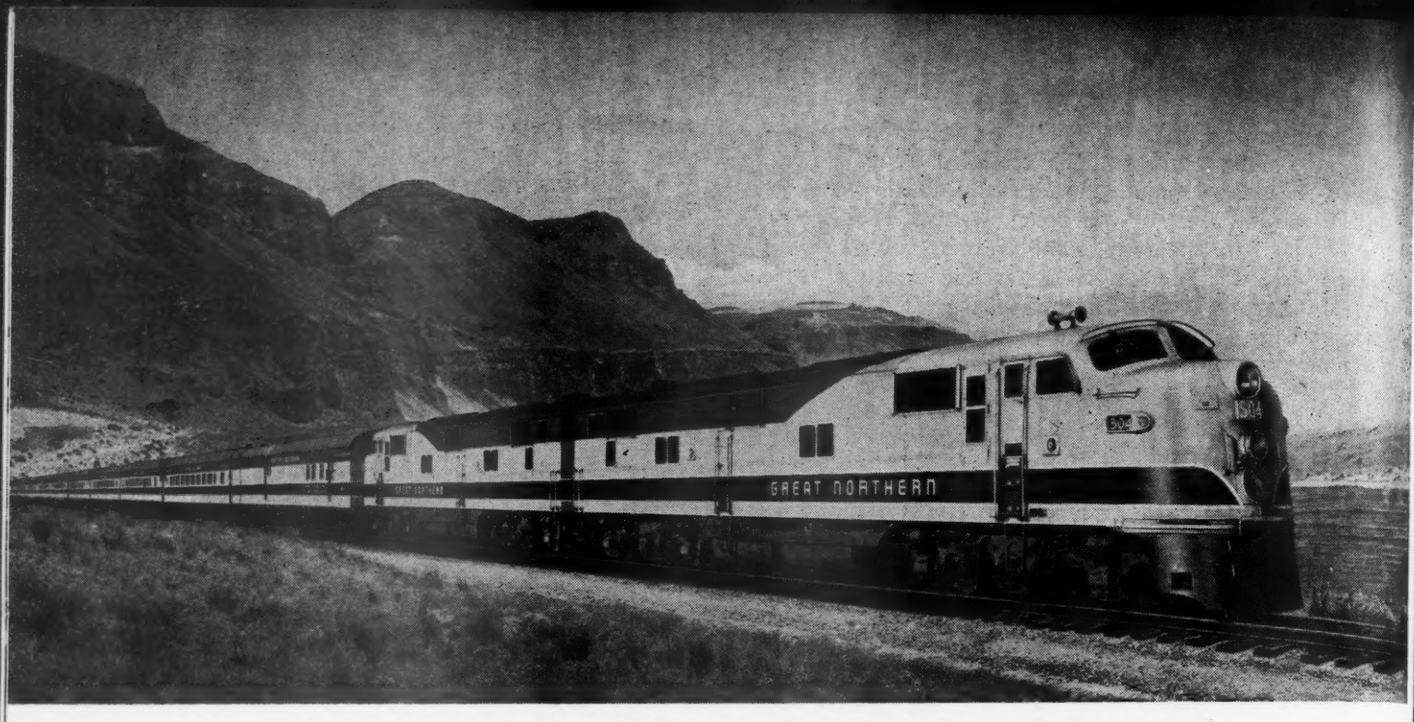
It is, therefore, of added interest that the Franklin Institute this year will also award a Henderson medal to S. N. Wight, engineer of train operation, General Railway Signal Company, "in consideration of his accomplishments in the invention and development of major signaling systems, thus contributing to the safety, speed and reliability of railroad operation." As stated by the Franklin Institute in the announcement of the award: "His most outstanding contributions to railroad signaling are his (1) absolute-permissive block system, (2) centralized traffic control, and (3) entrance-exit interlocking." Critics will doubtless continue to say that railroad methods are archaic; that they do little to improve their services—but this is mere ranting in the face of such recognition as has been given to Dr. Grondahl and Mr. Wight.

"Railway Progress," No. 2

The April issue, No. 2, of "Railway Progress," the monthly publication of the Federation for Railway Progress, instituted by Chairman Robert R. Young of the Chesapeake & Ohio, has appeared—and is wholly constructive in its content. Articles include a critical discussion of Section 77 of the Bankruptcy Act by former-Senator Burton K. Wheeler; a short history of the Pennsylvania Railroad by Fred B. Stauffer, railroad reporter for the New York Herald-Tribune; an examination of railroad rate-making by Vice-President R. S. Marshall of the C. & O.; and an article on the principles of passenger station modernization.

This number plainly has as its single purpose the spreading of enlightenment about the economic, financial, and physical aspects of railroading—and the more people who read it and digest its message, the better off the railroads and the country will be. This No. 2 issue affords a welcome contrast to the first one which, as noted in the March 8, 1947, *Railway Age*, started out with a polemic on "railroad monopoly" by Wendell Berge—leaving the reader with some doubts whether "Railway Progress" might not have as its purpose the public chastisement of the railroad industry, rather than the encouragement of constructive policies within and toward it.

The only item in No. 2 which is in any way critical of carefully-considered industry policy is a brief and temperate statement by Mr. Young of the fault he still finds with the Reed-Bulwinkle Bill. No one, however, can reasonably object to his exercise of his right to an independent opinion on this subject, even though he appears to be quite alone among people with a practical connection with the transportation business, either as producer or customer, in these views of his. The issue also tells how the federation is organized and how, beginning early next year, the governing body and officers will be elected by the membership. Brief biographical sketches of the seven distinguished citizens who compose the federation's advisory committee are included, too.



One of the new "Empire Builders" beside the Columbia river near Wenatchee, Wash.

Great Northern Gets First Postwar Tra

THE nation's first de luxe postwar-built transcontinental streamliners, the new "Empire Builders" of the Great Northern and the Chicago, Burlington & Quincy, were placed in regular daily service between Chicago and Seattle-Portland on February 23, as announced in a news forecast in the *Railway Age* issue of February 1. This spectacular new equipment, purchased at a cost of about $7,000,000, includes five 12-car trains drawn by 4,000-hp. Diesel locomotives, four of these trains being owned by the Great Northern and the fifth by the Burlington, which operates the trains between Chicago and St. Paul, Minn. The over-all run of 2,211 miles between Chicago and the Pacific Coast cities is made in 45 hr., or 13½ hr. less than the previous scheduled running time over the northern route.

These trains, the first to be ordered by any railroad in anticipation of the postwar period (November 4, 1943), were built by the Pullman-Standard Car Manufacturing Company. They include the first postwar-designed coaches for transcontinental service and the first sleeping cars built and delivered to any railroad since V-J Day. Each train consists of a baggage-mail car, one 60-seat coach, three 48-seat coaches, a coffee-shop car, dining car, four sleeping cars, and an observation-lounge car, having a total passenger-carrying capacity of 307. The five two-unit 4,000-hp. Diesel locomotives were built by the Electro-Motive Division, General Motors Corporation.

Many unusual features, built into the new "Empire Builders," are well adapted to increase the prestige and popularity of this well-known train. Among such features, the following may be mentioned:

The sleeping cars are the first to utilize the duplex roomette, with the exception of one experimental car built by Pullman-Standard before the war and thoroughly tested in wartime service.

"Empire Builder" Schedule

Chicago-Seattle	45	hr.
St. Paul-Seattle	38	hr.
Chicago-St. Paul	6¼	hr.

Westbound schedule (Read down)	Miles from Chicago	Stations	Eastbound schedule (Read up)
		(Central time)	
lv. 1:00 p.m.	0	Chicago, Ill.	ar. 2:00 p.m.
3:55 p.m.	186	Dubuque, Iowa	10:48 a.m.
5:25 p.m.	297	La Crosse, Wis.	9:15 a.m.
ar. 7:45 p.m.	427	St. Paul, Minn.	lv. 7:15 a.m.
lv. 8:00 p.m.			ar. 7:00 a.m.
lv. 8:30 p.m.	438	Minneapolis, Minn.	lv. 6:30 a.m.
10:05 p.m.	529	Willmar, Minn.	4:46 a.m.
11:57 p.m.	642	Breckenridge, Minn.	3:00 a.m.
1:00 a.m.	688	Fargo, N. D.	1:55 a.m.
3:02 a.m.	812	New Rockford, N. D.	11:48 p.m.
4:55 a.m.	921	Minot, N. D.	10:10 p.m.
ar. 7:20 a.m.	1,041	Williston, N. D.	lv. 7:40 p.m.
		(Mountain time)	
lv. 6:20 a.m.	1,041	Williston, N. D.	ar. 6:40 p.m.
(a) 9:10 a.m.	1,198	Glasgow Mont.	(b) 3:45 p.m.
12:05 p.m.	1,351	Havre, Mont.	12:55 p.m.
2:10 p.m.	1,455	Shelby, Mont.	10:45 a.m.
(c) 2:45 p.m.	1,480	Cut Bank, Mont.	(d) 10:17 a.m.
6:15 p.m.	1,607	Whitefish, Mont.	6:55 a.m.
ar. 9:15 p.m.	1,741	Troy, Mont.	lv. 3:55 a.m.
		(Pacific time)	
lv. 8:15 p.m.	1,741	Troy, Mont.	ar. 2:55 a.m.
ar. 11:30 p.m.	1,881	Spokane, Wash.	lv. 11:30 p.m.
lv. 12:01 a.m.			ar. 11:00 p.m.
2:17 a.m.	2,003	Ephrata, Wash.	8:38 p.m.
3:30 a.m.	2,055	Wenatchee, Wash.	7:30 p.m.
5:55 a.m.	2,126	Skykomish, Wash.	5:15 p.m.
7:10 a.m.	2,178	Everett, Wash.	3:58 p.m.
ar. 8:00 a.m.	2,211	Seattle, Wash.	lv. 3:00 p.m.

(a) Stops to discharge revenue passengers from Fargo and east and to receive revenue passengers for Spokane and west.
(b) Stops to discharge revenue passengers from Spokane and west and to receive passengers for Fargo and east.
(c) Stops to discharge revenue passengers from Williston and east and to receive revenue passengers for Spokane and west.
(d) Stops to discharge revenue passengers from Spokane and west and to receive revenue passengers for Williston and east.

All photographs courtesy of the Great Northern

Five 12-car trains, powered with Electro-Motive Diesels and having cars built by Pullman-Standard, have reduced running time between Chicago and Seattle, Wash., 13½ hr.

Transcontinental Streamliners

Three types of sleeping accommodations are afforded in one car. Two cars in each train carry four open sections, eight single-occupancy duplex roomettes, and four bedrooms.

In addition to conventional running hot and cold water, these sleepers are the first to have ice water on tap in all rooms, eliminating the water carafes previously used.

Stainless-steel kitchens in the dining cars are each equipped with a deep-freeze unit and automatic dish washer.

Bedrooms in the sleepers are the first to have the wardrobe at the aisle side for hanging clothing.

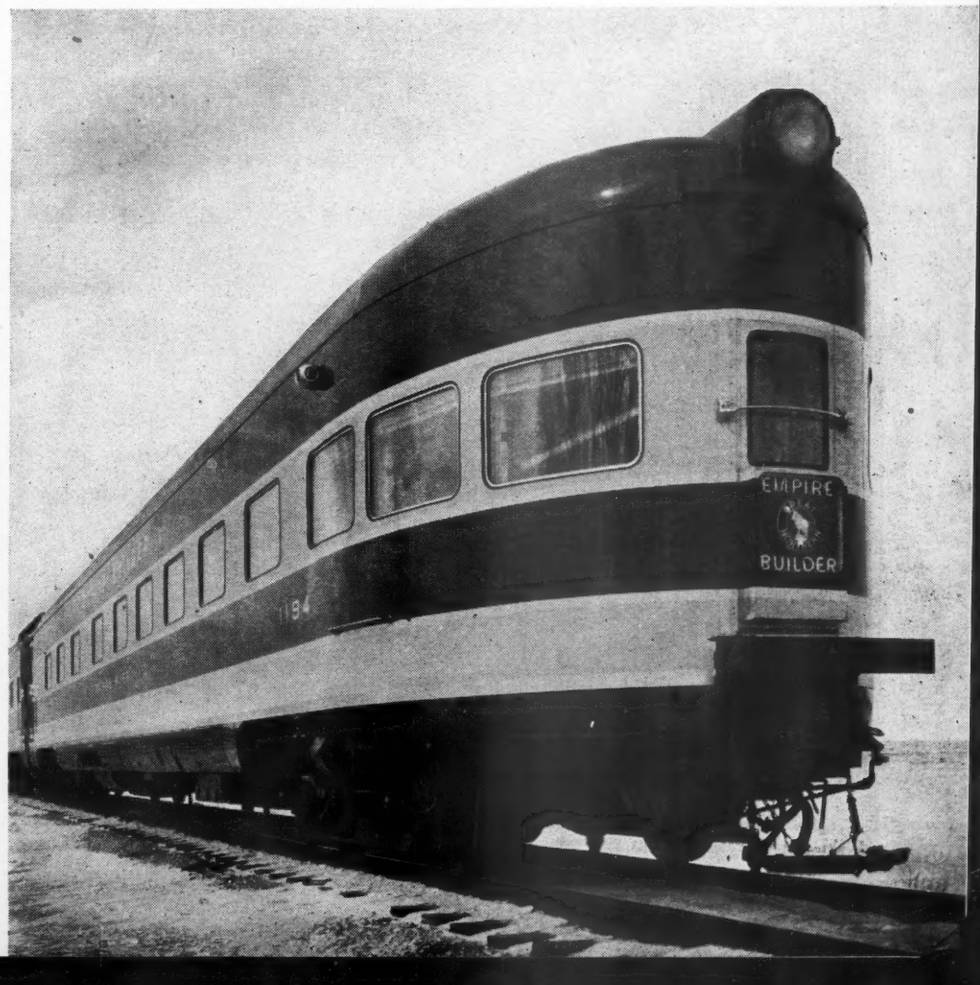
Electrically controlled brakes, combined with a brake-shoe controller, give graduated maximum braking ratio at all speeds and eliminate wheel sliding.

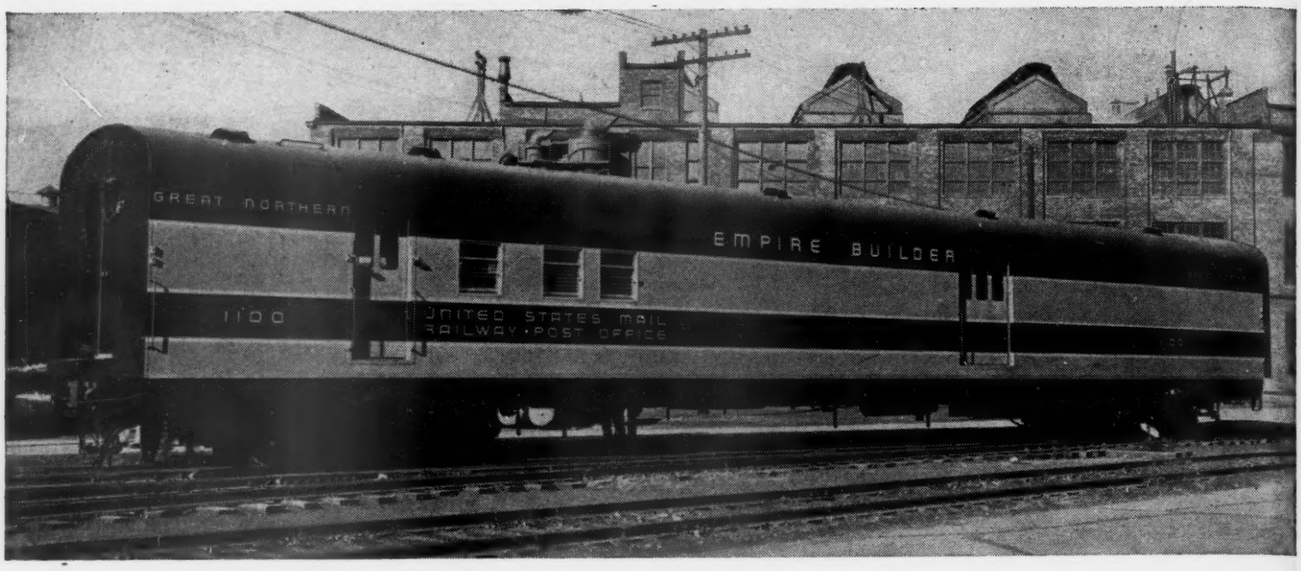
The folding vestibule steps are equipped with lights at foot level for a clear view of the steps at night.

A red Mars light on the rear of each train automatically lights up and oscillates in a figure-eight light pattern whenever train speed is reduced below 20 m.p.h. This emergency warning, once activated, remains in operation until the train speed again exceeds 20 m.p.h. Locomotives also are equipped with Mars red and white oscillating lights.

A master radio system, with speakers in all cars except the sleepers, becomes, by turning a switch, a public address system which passenger representatives and conductors can use to broadcast announcements to passengers throughout the train from a desk in the first coach. Train and locomotive crews also can communicate over a telephone between the cab and the first coach.

The Day-Nite coaches contain Heywood-Wakefield chaise-lounge reclining seats with Pullman-Standard designed leg rests which fold down from the back of the seat ahead, giving added





Above—The mail-baggage car

comfort and reclining position when desired.

All cars have four-wheel trucks fitted with Timken roller-bearing journals.

The exterior color scheme is a striking combination of alternate broad bands of brilliant olive green and deep orange which not only "trade mark" the trains but can be easily seen at a distance and, hence, provide an additional safety factor in high-speed operation. The roof and letter board, to just above the windows, are of olive green; the window band is deep orange running the length of the car; and just below the windows is a broad band of olive green. Another band of deep orange finishes off the bottom of the sides, and the car skirts are of olive green. Striping and lettering are in synthetic gold and aluminum.

At the head end of each of the new "Empire Builders" is an Electro-Motive two-unit, 4,000-hp. Diesel locomotive which is designed for a maximum speed of 92 miles an hour, but does more to maintain high average speeds by reducing the number and length of stops for fuel and servicing and also accelerating trains more rapidly. This locomotive is 142 ft. long and weighs 637,660 lb.

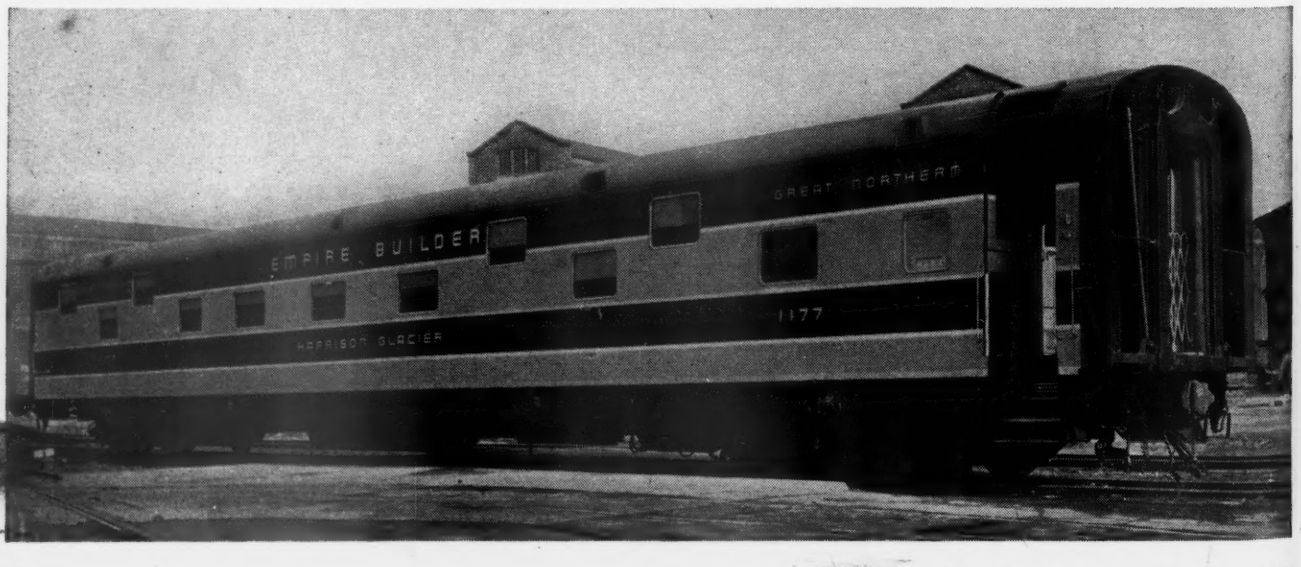
Individual cars in the trains are 85 ft. long between coupler pulling faces and have vestibules at one end only, except the baggage, coffee-shop and dining cars which have no vestibule entrances. In general, coaches are coupled with the vestibule ends, in which men's lounge rooms are located, adjoining. Similarly, two non-vestibule ends with women's rooms are placed together for greater convenience in case one room becomes crowded and passengers want to move to the other.

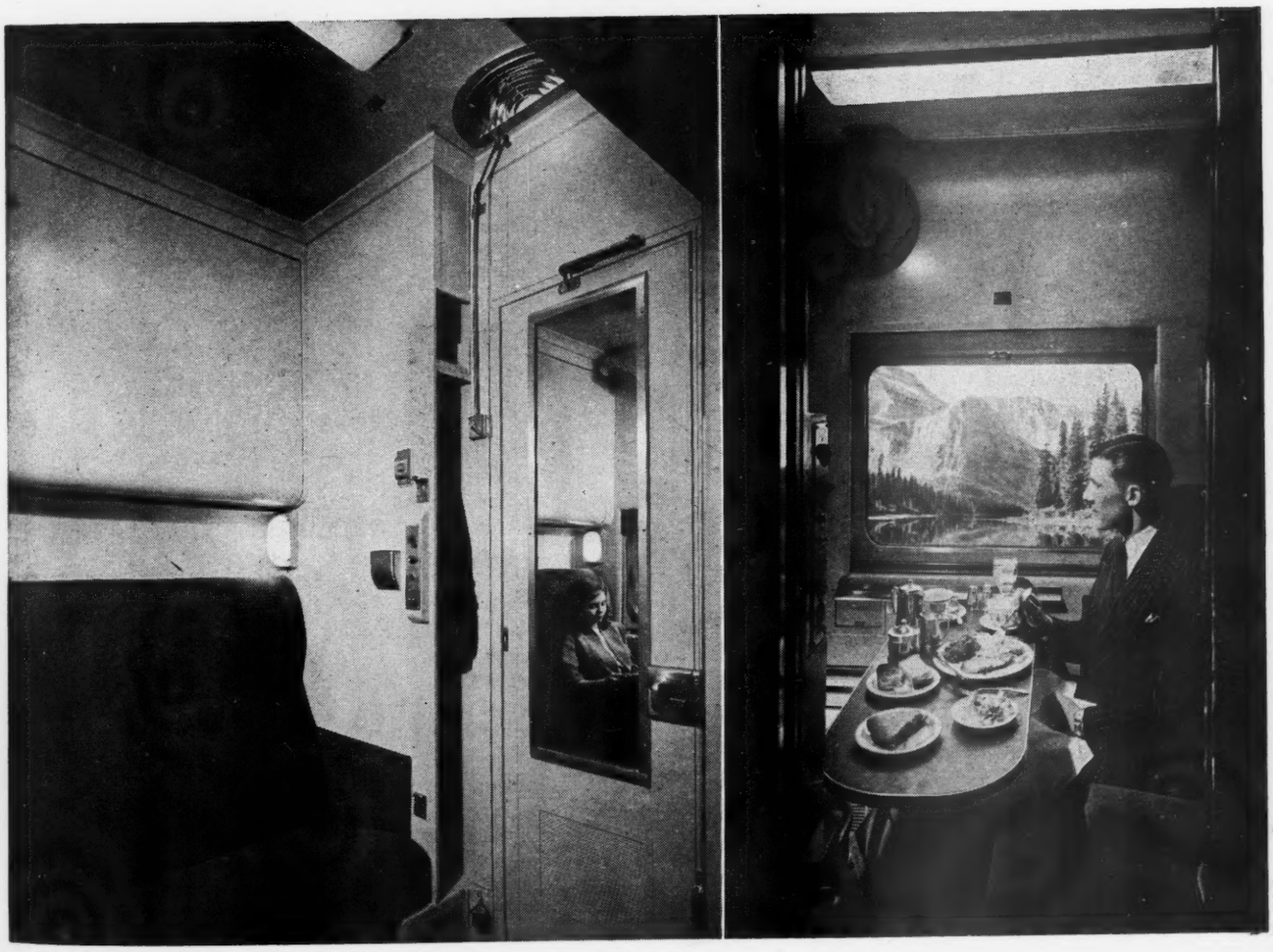
The coffee-shop car and adjoining diner are located in the middle of the train, with four coaches ahead and

Facing page (top)—Interior appointments in Day-Nite coach—Seat back raised (left), and lowered for foot and leg rest (right)

Facing page (bottom)—The bedroom has a wardrobe at the end of the sofa (left)—Meals can be served in a duplex-roomette (right)

Below—Window arrangement of one of the duplex-roomette sleepers





Lounge and lunch counter in the coffee-shop car

Below—The lounge in the coffee-shop car seats ten

four sleeping cars and the observation-lounge at the rear. The coffee-shop car is in reality a lounge-lunch-dormitory car with lounge seats for 10, lunch-counter stools for 10, and a dormitory section with accommodations for a 20-man crew. The diner is equipped with a modern stainless-steel kitchen and pantry and has a dining section with room to seat 36 persons.

The four sleeping cars behind the diner have accommodations for 24 passengers each. The first two are arranged with four double sections, eight duplex roomettes and four bedrooms; the next two have 16 duplex roomettes and four bedrooms, each. The observation-lounge also has two bedrooms, and a drawing room accommodating seven, and an observation lounge, seating 27.

Indigenous Colors Used

Passengers will find the new "Empire Builders" especially interesting from a color and decorative standpoint. The Great Northern worked long and closely with Ralph Haman, Pullman-Standard's engineer of color and design, in developing a decorative treatment characteristic of the Northwest country through which the trains operate. Glacier National Park, which is served by the Great Northern was the inspiration for most of the colors used, the lakes, trees, flowers and foliage suggesting the special blues, greens, yellows and reddish browns incorporated in color schemes of the various cars.

One of the most dramatic cars is the diner, in which color and design experts have built into the panels between the tables facsimiles of wild flowers which grow abundantly in Glacier Park. The entire diner is done in blues which match the Walter Loos photographic flower reproductions. The use of copper for the metal trim of the diner also gives an authentic Montana touch.

The color theme and design of the observation car is exclusive and distinctive to the territory served, for here tribute is paid to the Blackfeet Indian tribe of northwestern Montana. Some of the finest Winold Reiss paintings set the motif of the observation car. Draperies in the car are exact duplicates of the famous Hudson's Bay blankets, and flooring, seats and wall coverings have been keyed into the general motif. To bring action into the car and follow the pioneer theme, a series of water colors, painted by the late Charles M. Russell, a Montana cowboy, are reproduced photographically and placed on the bulkheads.

Coaches in the five trains have been done in color tones of blue, green, yellow and brown, with the stronger colors used below the windows and receding to lighter shades at eye level and on the ceilings. Flesh- and gold-tone mirrors and murals of scenes taken along the Great Northern right-of-way further accentuate the beauty of the coaches. Five coaches use the flesh- and gold-tone mirrors, 10 the photographic murals, and five famous Great Northern lithographs.

Indian picture writing is used as the decorative theme in the coffee-shop car. Here, too, the passenger finds the Hudson's Bay colors woven into the

counter covering, and color combinations follow the authentic styling of the other cars. Sleeping cars also follow the general color scheme, featuring shades of tan, apricot, greens, grays and yellows.

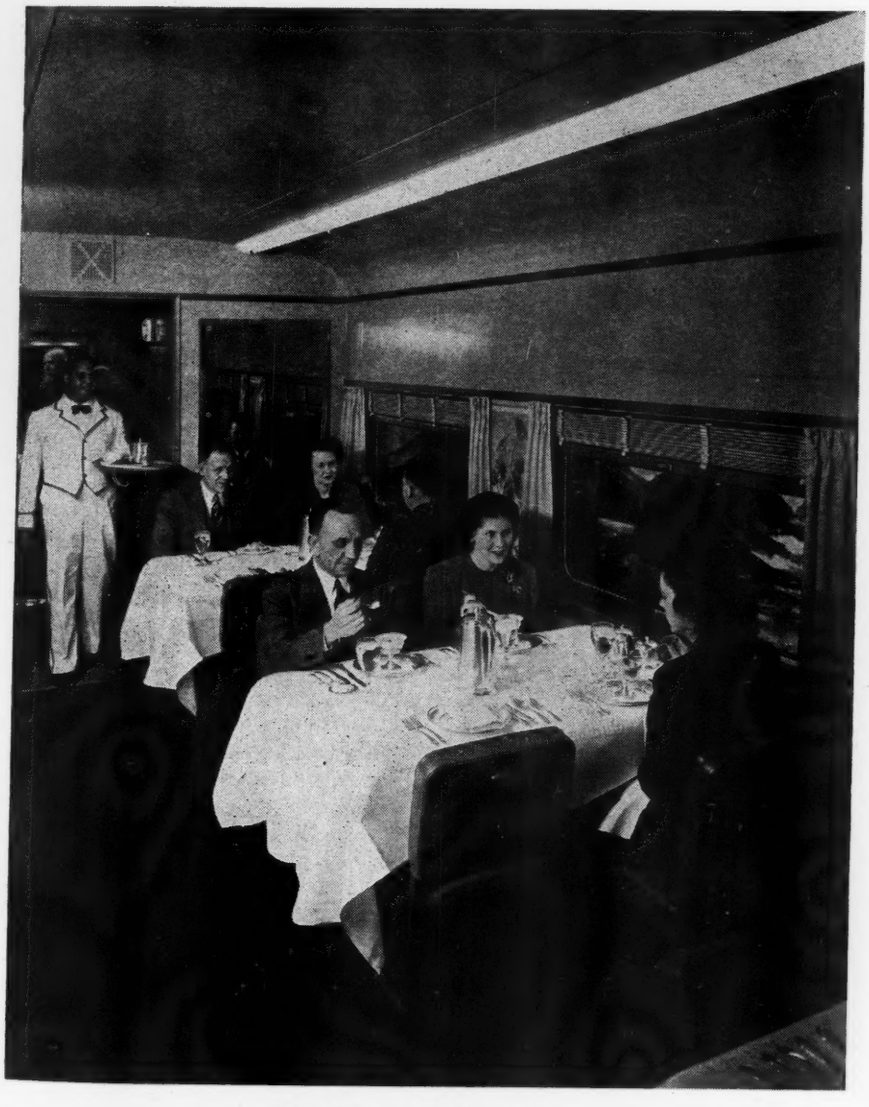
To link the "Empire Builders" still further with the country through which they operate special names have been selected for individual cars. For example, the coffee-shop and dining cars have been named for lakes such as Two Medicine, Red Eagle, McDonald and Chelan. The sleepers are named for famous passes like Logan, Triple Divide, Lincoln and Cut Bank, and Glaciers like Oberlin, Sexton, Harrison and Sperry. Observation cars are named for rivers, including the Mississippi, Missouri, Flathead, Kootenai and Marias.

All of the new "Empire Builder" cars embody Pullman-Standard welded girder-type construction, utilizing low-alloy, high-strength steel for underframes, sides, ends and roofs and meeting A. A. R. strength requirements. Substantial weight savings without sacrifice of strength have been effected, the average car weights varying from 112,300 lb. for the mail-baggage car to 137,700 lb. for one of the sleepers, as shown in the table. The car body bolsters are built-up, arc-welded, box-section with two web plates and top and bottom cover plates. The buffer beams are built-up welded construction. End frames are designed to suit either the wide-type vestibule, dummy end, or rounded observation end, as called for by individual floor plans. Roof construction is of the turtle-back type, continuous from end to end of the car. Draft gears are of the Waugh twin-six type and National tightlock Type-H couplers. Buffers are designed with side stems and coil springs of sufficient capacity to keep buffers in out position.

Average Weights and Capacities of the "Empire Builder" Cars

Type of car	Plan number	Seating capacity	Sleeping capacity	Journal size, in.	Weight, lb.*
Mail-baggage	7494	..	..	6 × 11	112,300
Coach	7495	60	..	5½ × 10	119,500
Coach	7496	48	..	5½ × 10	119,500
Coach	7497	48	..	5½ × 10	119,500
Lounge-lunch-dormitory	7498	20	20†	6 × 11	128,500
Diner	7499	36	..	6 × 11	130,000
Sleeping	4107	..	24	6 × 11	133,200
Sleeping	4108	..	24	6 × 11	137,700
Sleep.-observ.-lounge	4109	27	7	5½ × 10	123,400

* Less water and live load.
† For diner and coffee-shop crews.



The diner seats 36 persons

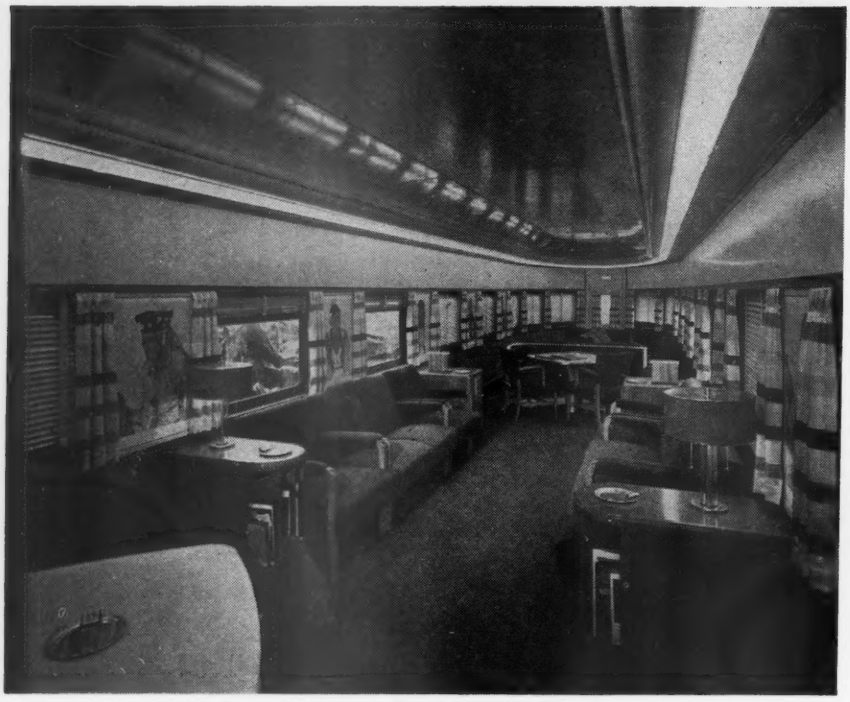
At all vestibules, Pullman-Standard pivoted four-tread steps are installed on each side of the platform and operated in conjunction with the trap doors. Vestibule diaphragms have center and outer closures and center-stem suspension with a vertical support rod on each side. The face plate is made of wear-resisting alloy steel. Outer diaphragms are of rubber.

The insulation in three of the trains is Stonefelt and in two trains, Fiberglas. This insulation is 3 in. thick in the floors, ends and roofs and 2½ in. in the sides to give adequate control of interior car temperatures without excessive demands on air heating or cooling equipment.

Interior finish consists of Tempered Presdwood for the wainscoting of open sections, passageways and toilet. Aluminum wainscoting is used in all rooms, in the observation lounge, and for pier panels, end finish, and the ceiling in open sections. The ceiling in bedrooms, compartments, and drawing rooms is of Presdwood, except that aluminum is applied where short-radius surface curves require the use of metal. Stainless steel .030 in. thick is shaped to the contour of the carlines in the buffet.

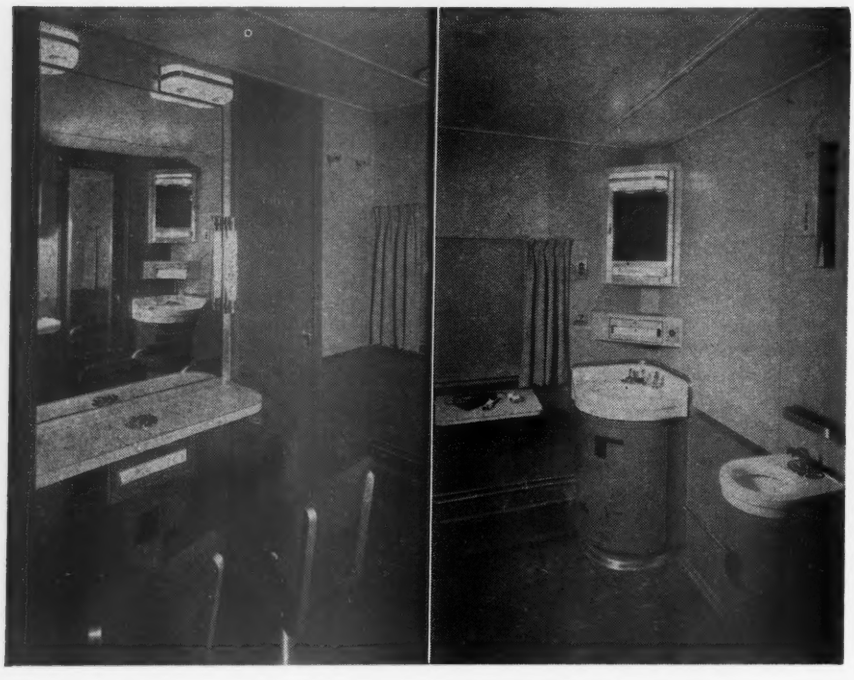
Heating and Air-Conditioning

All cars have the Vapor zone-control heat equipment which maintains temperatures in the various car sections, compartments, rooms and lounges as determined by the setting of individual



Above—The observation lounge

Below—Coach toilet facilities—women's room, left, and men's room, right



thermostat controls. Floor heat is supplied from Vapor fin-type radiation units. In the coaches, coffee-shop and dining cars Vapor automatic control panels are used. In the sleepers the control panels are Vapor selective type. The main steam trainline is Electrunite drawn-steel tubing, of 2⅞ in. outside diameter, with welded joints. Baker heaters with an auxiliary heating system are installed in the baggage car and all coaches for emergency heating.

The air-conditioning equipment is of the electro-mechanical type of eight tons capacity, using Freon F-12 refrigerant. It includes a Frigidaire compressor-motor unit with Frigidaire controls and evaporator, and a Trane evaporative condenser. Provision is made for a deodorizer in the recirculating air chamber of the Dorex G-3 type. Air ducts from the overhead unit along the ceiling center line include aluminum and Presdwood construction using parts of the car interior wherever practicable. Air outlets in all sleeping rooms are of the Anemostat diffuser type. In the coaches, coffee-shop, diner and observation cars the underside of the air duct consists of Pyle-National Multi-vent perforated air-diffuser panels, hinged for cleaning. Filters are of the Midwest demountable type.

Air-brake equipment consists of the New York H. S. C. schedule with D-22 BR control valve, electro-pneumatic straight-air control and speed-control governor. The American Brake Shoe Controller, which prevents wheel sliding, is driven from a spline bushing on the end of the axle. All cars except the observation car have air-controlled sanding equipment to operate in conjunctive with the controller. A vacuum cleaning connection box is supplied on each side of the car, accessible through the skirt. Hand brakes are of the National Brake Company's wheel type in the cars with vestibules and National Peacock pump-type on the cars without a vestibule. Provision is made at the observation end for back-up equipment, including an operating valve, warning horn and air gage in a small locker just above the floor level where it is normally concealed but readily available for use when needed.

Lighting Equipment

In the main seating compartments of the coaches, Luminator individual reading lights are installed in the overhead baggage racks. The single fixture is equipped with two lenses controlled by individual switches, one lens to supply reading light for the passenger on the window side and the other for the aisle passenger. The light beam pattern from the reading lights is designed so as to give the proper intensity at the reading plane of one passenger without overlapping the seat area of any of the passengers adjacent to, ahead of, or behind it.

The coach aisle lighting consists of nine magnifying-lens glass fixtures which project a narrow high-intensity beam of light the width of the aisle without extending into the seating area. This fixture also gives a soft light for the ceiling and upper portion of the car. At night the aisles are illuminated with 10-watt seat-pedestal lights. Vestibule and passageways are lighted with magnifying-lens glass fixtures.

In the lavatories and toilets of the coaches, similar magnifying-lens glass fixtures are also used. The mirror lighting consists of magnifying-lens

fixtures at the top of the mirrors. The women's dressing rooms contain large make-up mirrors with side lighting.

In the coffee-shop car the light fixtures are also of the magnifying-lens type.

In the diner, the main dining-room lighting consists of two rows of Safety continuous fluorescent ceiling troughs. Fifteen-watt incandescent night lights are incorporated in these troughs. The lobbies and the passageway of the diner are equipped with magnifying-lens incandescent lighting.

In the sleeping cars, main lighting of the passageways and the rooms consists of Safety fluorescent fixtures. The individual berth and reading lights are incandescent fixtures and all lights are equipped with incandescent blue night lights.

The observation lounge is illuminated by a Safety fluorescent trough which is continuous around the entire ceiling, including the curved end at the rear of the room. This fixture is so designed that, in addition to giving direct fluorescent lighting, it also gives indirect illumination to the center of the ceiling. The entire trough is equipped with white incandescent night lights.

Electric Power Supply

Electric power is supplied from a Safety 20-kw. 40-volt Genemotor with a built-in 25-hp. 220-volt a.c. motor which can be plugged in to furnish power for lights and air cooling when cars are at terminals. In normal operation on the road, the Genemotor is driven from one of the car axles by a Spicer Model 6-I gear unit. The motor alternator on each car equipped with fluorescent lights is a Safety two-kw. 32-volt d.c. to 110-volt a.c. machine. A converter is installed in each switchboard locker to supply 110-volt current for electric shavers.

The observation car carries a radio receiver, Pullman antenna, and public address amplifier, with its associated power and control equipment conveniently located in a locker. An eight-conductor shielded trainline and connectors carry the radio receiver and public address announcements through the train. Other electric connections are carried between cars by trainline jumpers with A. A. R. color code wires.

Trucks

The trucks have an 8-ft. 6-in. wheel base and are of the four-wheel, single-bolster type with integral cast-truck frames of alloy steel, made by the General Steel Castings Corporation. The 36-in. steel wheels are mounted on normalized and tempered axles with either 5½ in. by 10-in., or 6-in. by 11-in. journals and Timken roller bearings. Rubber-insulated bolster anchors are installed, eliminating the need for transom or bolster wear plates. Drews spring-type side bearings and Miner 4-in. three-piece safety center pins are used. The trucks are equipped with A. S. F. unit-cylinder clasp brakes, having two brake cylinders per truck, automatic slack adjusters and an anti-rattling device in the brake rigging.

Partial List of Materials and Equipment on the New "Empire Builder" Cars

Low-alloy high-tensile steel	Carnegie-Illinois Steel Corp., Pittsburgh, Pa. Inland Steel Co., Chicago
Trucks:	
Truck frames	General Steel Castings Corp., Eddystone, Pa.
Roller bearings	Timken Roller Bearing Co., Canton, Ohio
Center pins	W. H. Miner, Inc., Chicago
Springs, side bearings and clasp brakes	American Steel Foundries, Chicago
Wheels	Edgewater Steel Co., Pittsburgh, Pa.
Axles	Carnegie-Illinois Steel Corp., Pittsburgh, Pa.
Shock absorbers	Houde Engineering Div. of Houdaille-Hershey Corp., Detroit, Mich.
Brake shoes	American Brake Shoe Co., New York
Air brakes	New York Air Brake Co., New York
Wheel-slip controller	American Brake Shoe Co., New York
Hand-brakes	National Brake Co., New York
Draft gears	Waugh Equipment Co., New York
Couplers and yokes	National Malleable & Steel Castings Co., Cleveland, Ohio
Insulation:	
Fiberglas (2 trains)	Gustin Bacon Mfg. Co., Kansas City, Mo.
Stonefelt (3 trains)	Johns-Manville Sales Corp., New York
Floor composition	Tuco Products Corp., New York
Interior Finish:	
Aluminum	Aluminum Co. of America, Pittsburgh, Pa.
Tempered Presdwood	Masonite Corp., Chicago
Aluminum-covered plywood	Haskelite Mfg. Corp., Grand Rapids, Mich.
Steel	American Rolling Mill Co., Middletown, Ohio
Stainless steel for all pantries and kitchens	Allegheny Ludlum Steel Corp., Pittsburgh, Pa. United States Steel Corp., Pittsburgh, Pa.
Monel metal	International Nickel Co., New York
Window sash and fixtures	Adams & Westlake Co., Elkhart, Ind.
Polished plate glass:	
Sleepers	Pittsburgh Plate Glass Co., Pittsburgh, Pa.
Other cars	Libbey-Owens-Ford Glass Co., Toledo, Ohio
Prismatic plate glass	Pressed Prism Plate Glass Co., Morgantown, W. Va.
Paint:	
Exterior	E. I. du Pont de Nemours & Co., Wilmington, Del.
Interior	Pittsburgh Plate Glass Co., Pittsburgh, Pa. Sherwin Williams Co., Chicago
Leatherette wall covering, leather stool and diner chair covering	Blanchard Bros. & Lane, Newark, N. J. Goodall Fabrics, Inc., Chicago
Photo murals	Kaufmann Kabry, Chicago
Floor covering—carpets	Beck & Blatchford, Chicago Bigelow Sanford Carpet Co., New York Holmes Archibald & Son, Chicago
Rubber floor covering	Goodyear Tire & Rubber Co., Akron, Ohio
Coach seats	Heywood-Wakefield Co., Gardner, Mass.
Seat covering, coaches	Collins & Aikman Corp., New York
Observation chairs, carpets	Beck & Blatchford, Chicago
Chairs for dining cars	General Fireproofing Co., Youngstown, Ohio
Venetian blinds	Ajax-Consolidated Co., Chicago
Draperies	Goodall Fabrics, Inc., Chicago
Window curtains	Pantasote Corp. of N. J., New York
Window cappings	Formica Insulation Co., Cincinnati, Ohio
Water coolers:	
Ice-type (baggage mail cars)	Henry Giessel Co., Chicago
Electro-mechanical (coaches)	Cordley & Hayes, New York
Electro-mechanical (sleepers)	General Electric Co., Chicago
Washstands	Adams & Westlake Co., Elkhart, Ind.
Water closets—plumbing	Crane Co., Chicago Duner Co., Chicago
Sanitary napkin dispensers	West Disinfecting Co., Long Island City, N. Y.
Fire extinguishers	Pyrene Mfg. Co., Newark, N. J.
Drinking-cup equipment	Logan Drinking Cup Div., U. S. Envelope Co., Worcester, Mass.
Heating equipment and controls	Vapor Car Heating Co., Chicago
Steam trainline	Steel & Tube Div., Republic Steel Corp., Cleveland, Ohio
Emergency hot-water heaters	Vapor Car Heating Co., Chicago
Air-conditioning equipment and refrigerating units	Frigidaire Division, General Motors Corp., Dayton, Ohio Trane Co., La Crosse, Wis.
Indicating lamps on air-conditioning controls	H. R. Kirkland Co., Norristown, N. J.
Air filter	American Air Filter Co., Louisville, Ky.
Air diffusers:	
Sleeping rooms	Anemostat Corp. of America, New York
Other cars	Pyle-National Co., Chicago
Radio and public address	R. C. A. Victor Div., Camden, N. J.
Lighting fixtures	Crouse Hinds Co., Syracuse, N. Y. H. R. Kirkland Co., Morristown, N. J. Luminator, Inc., Chicago Safety Car Heating & Lighting Co., New York
Batteries	Electric Storage Battery Co., Philadelphia, Pa. Gould Storage Battery Corp., Depew, N. Y.
Battery-charging receptacles	Pyle-National Company, Chicago
Circuit breakers and circulating fans	Westinghouse Electric Corp., Pittsburgh, Pa.
Everdur battery-box floors and hopper tubes	American Brass Co., Waterbury, Conn.
Intake blower fans	B. F. Sturtevant Co., Boston, Mass.
Motor alternator, a.c.-d.c., exhaust fans	Safety Car Heating & Lighting Co., New York
Generators and controls	Safety Car Heating & Lighting Co., New York
Generator drive	Spicer Manufacturing Corp., Toledo, Ohio
Air compressor and other V-belt drives	Dayton Rubber Manufacturing Co., Dayton, Ohio
Headlights and marker lights	Pyle-National Co., Chicago
Tail lights	Mars Signal Light Co., Chicago

Photograph courtesy of Santa Fe

Railway purchases of miscellaneous materials and supplies required for the maintenance of equipment and fixed property totaled $1,017,402,000 in 1946, and all signs point to a continued heavy demand for those supplies throughout the current year

1946 Buying Well Above Prewar Levels

Expenditures for materials, supplies and equipment totaled $1,889,572,000—Capital disbursements for road, equipment and structures amounted to $561,957,000 — Passenger cars up 53 per cent

PURCHASES of materials, supplies, fuel and equipment by the Class I railroads of the United States in 1946 amounted to $1,889,572,000, according to the compilation of the Association of American Railroads. The 1946 total exceeded by $2,389,000 (0.01 per cent) the $1,887,183,000 spent for these purposes during the preceding year and came within 2.5 per cent of equaling the 21-year high established in 1944. Railway buying (excluding equipment) aggregated $1,570,555,000, compared with $1,572,404,000 in 1945 and $1,610,529,000 in 1944. Preliminary estimates of railway material and supply buying prepared by *Railway Age* from special reports submitted by Class I roads, and published in the Annual Statistical and outlook number on January 4, 1947, were within 2 per cent of actual aggregate of expenditures as reported by the A.A.R.

Gross capital expenditures by the Class I railroads in 1946 for new equipment, for improvements to equipment in service, and for additions and improvements to roadway and structures amounted to $561,957,000—a drop of 0.02 per cent below 1945's $562,980,000, but in excess of those of any other year since 1930.

Purchases of materials and supplies from manufacturers in 1946 aggregated $1,017,402,000. This total exceeds the $1,017,249,000 spent for similar materials and supplies during 1945, but is slightly less than the $1,024,697,000 expended in 1944. It nevertheless exceeds the total of any other year since 1926.

Shortages Still Persist

Last year's purchases again reflected critical shortages in many categories, particularly iron and steel items. Expenditures for rail dropped 15 per cent, while disbursements for track fastenings, bolts, spikes, etc., slipped 1 per cent below the 1945 total. This decrease in dollar amount occurred in spite of the fact that unit costs for these items increased substantially.

Crosstie purchases in 1946 amounted to $88,478,000—14 per cent more than expended for this purpose during the previous year and 4 per cent more than in 1944. The 1946 total also topped the $83,402,000 spent for crossties in 1943 by 6 per cent; surpassed 1942's $63,153,000 by 40 per cent; and exceeded the $49,494,000 expended for similar material in pre-war 1941 by 79 per cent.

Switch ties, which aggregated $7,828,000, also registered a substantial increase over 1945 purchases of $6,689,000, but sagged 41 per cent below the $13,174,000 spent for switch ties in 1944. Purchases of lumber and of all other forest products amounted to $52,678,-

000, or a decrease of $206,000 (0.4 per cent) below the $52,884,000 expended for this purpose during the preceding year. The 1946 total also sagged 13 per cent below 1944's $60,581,000, and compares with the $57,384,000 spent in 1943 and $44,039,000 in 1942.

Purchases of bituminous coal totaled $386,464,000, a decrease of 2.5 per cent ($9,707,000) compared with the preceding year and 10 per cent below the $429,497,000 spent for this purpose during 1944. Anthracite purchases totaled $4,745,000, or 21.5 per cent more than the $3,905,000 spent for similar supplies during the privous year. Fuel oil purchases in 1946 amounted to $149,033,000, or 4 per cent more than the $142,656,000 spent therefor in 1945 and almost 7 per cent more than in 1944. Gasoline purchases amounted to $5,815,000—a drop of 7 per cent ($450,000) below the $6,265,000 spent for this purpose during 1945, and 5 per cent ($327,000) below the $6,142,000 spent for gasoline during 1944. Expenditures for all other fuels, including coke, wood and fuel for illumination, amounted to $7,096,000—a gain of 15 per cent over 1945, and were 10 per cent, 29 per cent and 38 per cent greater, respectively, than purchases in 1944, 1943 and 1942.

A. A. R. Gives Delivered Cost

The A.A.R. compilation of purchases represents the delivered cost of materials received from commercial firms and includes materials obtained by Class I railways to build new locomotives and cars in railway shops. It does not include the value of new equipment purchased from commercial builders, a measure of which is presented later in this article in an analysis of gross capital expenditures.

Furthermore, the A.A.R. figures are restricted to the railways of this country and exclude all purchases by war agencies or military forces for building or rebuilding and operating railways in this and other countries. Moreover, these purchase figures *do not include* the cost of equipment, materials and machinery purchased by contractors for railway construction nor railroad expenditures for supplied heat, light, power and other utilities.

Iron and Steel Products

Railway purchases of iron and steel products during 1946 aggregated $520,546,000 and approximated the $520,876,000 spent for the same purpose during the preceding year. They were 1.2 per cent ($6,062,000) below 1944 purchases, but exceeded the 1943 total ($410,803,000) by 27 per cent, and topped the $433,089,000 spent for similar materials during 1942 by 20 per cent. Expenditures for locomotive and car springs

Annual Purchases of Materials and Supplies (Excluding Equipment) 1923-1946 † Class I Railroads

Year	Fuel (000)	Forest products (000)	Iron and steel products (000)	Miscellaneous (000)	Total (000)	Total less Fuel (000)
1923	$617,800	$232,511	$464,955	$423,437	$1,738,703	$1,120,903
1924	471,656	180,872	365,610	324,917	1,343,055	871,399
1925	459,465	170,305	419,255	343,018	1,392,043	932,578
1926	473,354	186,291	507,302	392,085	1,559,032	1,085,678
1927	438,821	175,729	432,604	348,774	1,395,928	957,107
1928	384,608	160,794	397,544	328,395	1,271,341	886,733
1929	364,392	157,551	437,840	369,752	1,329,535	965,143
1930*	306,500	134,600	329,700	267,700	1,038,500	732,000
1931*	244,500	76,250	202,100	172,150	695,000	450,500
1932*	178,250	52,200	100,550	114,000	445,000	266,750
1933	180,526	42,442	110,720	132,162	465,850	285,324
1934	217,294	64,271	159,758	158,901	600,224	382,930
1935	232,723	57,367	156,914	146,021	593,025	360,302
1936	272,270	76,683	273,753	180,715	803,421	531,151
1937	294,293	104,707	359,409	207,974	966,383	672,090
1938	243,783	56,968	152,176	130,355	583,282	339,499
1939	257,273	69,971	273,968	168,102	769,314	512,041
1940	273,556	82,185	315,048	183,674	854,463	580,907
1941	349,765	103,771	456,147	251,591	1,161,274	811,509
1942	426,335	115,227	433,089	285,160	1,259,811	833,476
1943	527,296	150,255	410,803	305,927	1,394,281	866,985
1944	585,832	158,957	526,608	339,132	1,610,529	1,024,697
1945	555,155	136,962	520,876	359,411	1,572,404	1,017,249
1946	553,153	148,984	520,546	347,872	1,570,555	1,017,402

† As compiled by Association of American Railroads.
* *Railway Age* estimates.

Classified Purchases of Fuel, Material and Supplies (Equipment Excluded) * Class I Railways—Years 1946 and 1945

Item	1946	1945	Per Cent Change
Fuel:			
Bituminous coal	$ 386,464,000	$ 396,171,000	– 2.5
Anthracite coal	4,745,000	3,905,000	+21.5
Fuel oil	149,033,000	142,656,000	+ 4.0
Gasoline	5,815,000	6,265,000	– 7.0
All other (coke, wood, fuel for illumination)	7,096,000	6,158,000	+15.0
Total Fuel	$ 553,153,000	$ 555,155,000	– .4
Forest Products:			
Crossties (treated and untreated)	$ 88,478,000	$ 77,389,000	+14.0
Switch and bridge ties (treated and untreated)	7,828,000	6,689,000	+17.0
Lumber, including timber (bridge and building, equipment, rough and finished lumber)	46,134,000	44,921,000	+ 2.7
Other forest products	6,544,000	7,963,000	–17.8
Total Forest Products	$ 148,984,000	$ 136,962,000	+ 8.7
Iron and Steel Products:			
Steel rail (new and second hand, except scrap)	$ 65,302,000	$ 77,038,000	–15.0
Wheels, axles and tires	42,374,000	44,794,000	– 5.0
Frogs, switches and crossings and parts of same	24,580,000	21,653,000	+13.5
Track fastenings, track bolts, spikes, etc.	61,686,000	62,420,000	– 1.0
Iron bridges, turntables and struct. steel, all kinds	6,929,000	6,673,000	+ 3.8
Bar iron and steel, spring steel, tool steel, unfabricated rolled shapes, wire netting and chain, except light coil, boiler, firebox, tank and sheet iron and steel, all kinds	32,298,000	30,960,000	+ 4.0
Forgings and pressed steel parts for locomotives	4,070,000	5,902,000	–31.0
Car forgings, iron and steel and fabricated or shaped steel for passenger and freight cars	20,154,000	18,861,000	+ 6.8
Flues and tubes for locos. and stationary boilers	7,050,000	7,103,000	– 0.8
Interlocking and signal material	28,987,000	28,880,000	+ 0.37
Telegraph, telephone and radio material	6,896,000	7,695,000	–10.0
Bolts, nuts, washers, rivets, lag screws, pins and studs	11,520,000	11,471,000	+ 0.42
Springs, helical and elliptical, all kinds for locomotives and cars	4,605,000	4,299,000	+ 7.0
Locomotives and car castings, beams, couplers, frames and car roofs	67,482,000	55,709,000	+21.0
Track and roadway tools, all kinds, miscellaneous track material and wire fencing. Motor, hand, push and velocipede cars and parts for same	10,511,000	12,435,000	–15.5
Machinery and repair parts, including all power-driven shop machinery	10,602,000	12,747,000	–17.0
Machinery, boilers, repair parts and all other iron and steel products	20,480,000	19,722,000	+ 4.0
Pipe, iron and steel and fittings, all kinds	8,389,000	7,940,000	+ 5.6
Hardware, all kinds, including nails	6,704,000	5,808,000	+15.0
Hand and small machine tools, such as drills, taps, reamers, dies, chasers, including air tools and parts	11,567,000	12,903,000	–10.0
Air brake material	28,258,000	27,069,000	+ 4.0
Standard and spec'l mechanical appliances for locomotives	18,822,000	18,535,000	+ 1.5
Automotive equipment and supplies	21,280,000	20,259,000	+ 5.0
Total Iron and Steel Products	$ 520,546,000	$ 520,876,000	– 0.1
Miscellaneous:			
Cement	$ 3,235,000	$ 3,565,000	– 9.0
Lubricating oils and grease, illuminating oils, boiler compound, waste	29,334,000	30,674,000	– 4.0
Non-ferrous metal and non-ferrous metal products	34,459,000	37,425,000	– 8.0
Ballast	16,327,000	22,287,000	–27.0
All electrical materials	28,359,000	28,304,000	+ 0.2
Stationery and printing	26,706,000	22,555,000	+18.0
Commissary supplies for dining cars, camps and restaurants	59,500,000	60,476,000	– 2.0
Rubber and leather goods	9,780,000	8,148,000	+20.0
Glass, drugs, chemicals, including chemicals for timber treatment, painters' supplies	39,897,000	40,932,000	– 2.6
Arch brick for locomotives	3,738,000	4,150,000	–10.0
Passenger car trimmings	11,431,000	8,465,000	+35.0
Locomotive, train and station supplies	23,313,000	25,385,000	– 8.0
All other miscellaneous purchases	61,793,000	67,045,000	– 8.0
Total Miscellaneous Purchases	$ 347,872,000	$ 359,411,000	– 3.0
Grand Total	$1,570,555,000	$1,572,404,000	– 0.2

* Source: Reports of the carriers to the Association of American Railroads.

(helical and elliptical) amounted to $4,605,000 in 1946, compared with $4,299,000 in 1945, $5,869,000 in 1944, $5,592,000 in 1943, and $5,174,000 in 1942. Hardware purchases during 1946 totaled $6,704,000, an increase of 15 per cent over the $5,808,000 expended in 1945. They sagged 4 per cent below 1944 purchases (which totaled $6,962,000), but exceeded by 7 per cent the $6,255,000 spent for hardware during 1943. Purchases of locomotive and car castings, beams, couplers, frames and car roofs gained 21 per cent over 1945 purchases, while telegraph, telephone and radio material dropped 10 per cent below similar 1945 purchases. On the other hand, automotive equipment continued its upsurge and increased 5 per cent; iron bridges, turntables and structural steel climbed almost 4 per cent; and pipe, iron and steel and fittings of all kinds gained almost 6 per cent over the 1945 level.

Class I roads spent $67,482,000 for locomotive and car castings, beams, couplers, frames and car roofs compared with $55,709,000 in the preceding year, $66,114,000 during 1944, $49,440,000 in 1943, and $61,359,000 in 1942. Expenditures for wheels, axles and tires amounted to $42,374,000, compared with 1945's $44,794,000—a drop of 5 per cent. Expenditures for bar iron and steel, spring steel, tool steel and unfabricated rolled shapes; wire belting and chain; boiler, firebox and tank steel and sheet iron totaled $32,298,000—4 per cent, or $1,338,000, above the $30,960,000 spent during 1945.

Expenditures for air brake material amounted to $28,258,000, 4 per cent more than the $27,069,000 spent for this purpose during 1945, but 3 per cent less than the $29,248,000 expended for similar material during 1944. Purchases of car forgings, and of iron and steel and fabricated or shaped steel for passenger and freight cars aggregated $20,154,000, an increase of almost 7 per cent over the 1945 high.

Locomotive Appliances

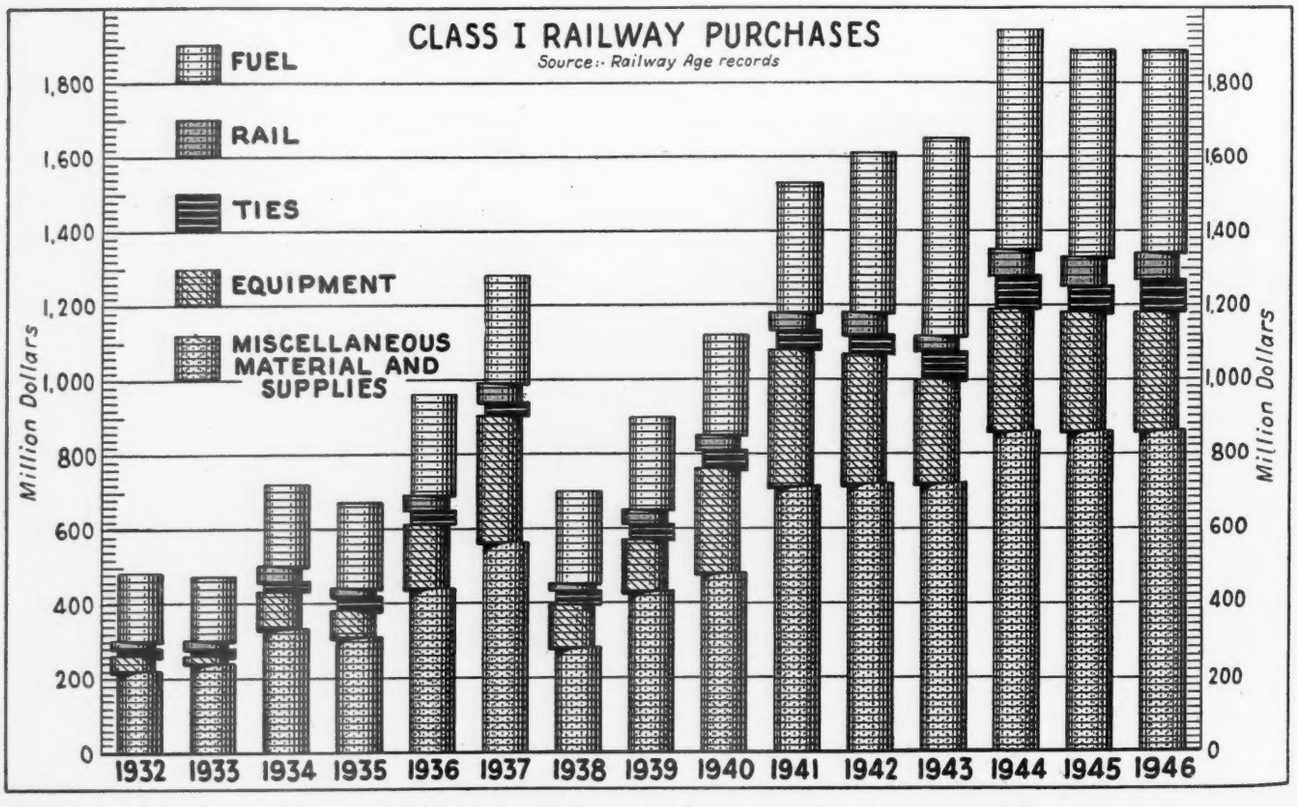
For standard and special mechanical appliances for locomotives the carriers spent $18,822,000 last year, compared with $18,535,000 in 1945, $21,206,000 in 1944, $18,478,000 in 1943, and $18,730,000 in 1942. Purchases of small machine tools, power tools and hand tools, such as drills, taps, reamers, dies and chasers, amounted to $11,567,000, a 10 per cent reduction, compared with $12,903,000 for 1945, and a 16 per cent reduction below the $13,821,000 spent for similar tools during 1944. However, the 1946 total surpassed the $10,265,000 expended during 1943 by 13 per cent; and topped the 1942 total of $10,107,000 in this classification by 14 per cent.

Expenditures for bolts, nuts, washers, rivets, lag screws, pins and studs amounted to $11,520,000—a gain of 0.04 per cent ($49,000) over last year's total of $11,471,000, but a drop of 14 per cent below the $13,452,000 expended for similar supplies in 1944.

The $7,050,000 spent for flues and tubes for locomotives and stationary boilers during 1946 approximated the $7,103,000 spent for this purpose during 1945, but slipped 9 per cent below the 1944 expenditure, which amounted to $7,732,000. Purchases of forgings and pressed steel parts for locomotives totaled $4,070,000, a slump of 31 per cent below the $5,902,000 spent for the same purposes during the preceding year. The 1946 total in this category also slipped 17.5 per cent below 1944's $4,933,000, but topped the $3,414,000 spent for similar supplies during 1943 by more than 19 per cent.

Expenditures for power-driven shop machinery during 1946 aggregated $10,602,000, a drop of 17 per cent below the $12,747,000 spent for this purpose during 1945. However, the 1946 expenditure topped the $8,842,000 for expended for this purpose during 1944 by 20 per cent, and surpassed 1943's $4,383,000 by 142 per cent. Additional expenditures for machinery, boilers, repair parts and all other iron and steel products amounted to $20,480,000, an increase of 4 per cent compared with $19,722,000 for 1945; $17,009,000 for 1944 and $11,384,000 for 1943.

Purchases of lubricants, boiler compounds and waste amounted to $29,334,-



Despite prolonged labor strife and the acute material shortages that persisted in many commodities throughout the year, railway buying in 1946 aggregated $1,889,572,000, and came within 2.5 per cent of equaling the 21-year high mark of 1944

000—a 4 per cent drop from the $30,674,000 expended for similar supplies during the preceding year. Expenditures for arch brick for locomotives amounted to $3,738,000—a drop of 10 per cent compared with $4,150,000 during 1945. Commissary supplies ($59,500,000) also registered a small drop (2 per cent) compared with 1945 purchases. However, they approximated the $59,373,000 spent for similar supplies in 1944 and topped the $56,417,000 spent for the same purpose during 1943 by 5 per cent. Locomotive, train and station supplies amounted to $23,313,000—a drop of 8 per cent below the 1945 total and 6 per cent less than the $24,782,000 spent for this purpose during 1944. However, the 1946 expenditure exceeded the $22,463,000 spent for similar supplies during 1943 by 4 per cent, and topped the 1942 total (which amounted to $16,192,000) by 44 per cent.

Purchases of Rail Slump

Reflecting the acute shortage that prevailed throughout the year, purchases of rail amounted to only $65,302,000—a drop of 15 per cent below 1945's $77,038,000; 14 per cent less than the $75,763,000 spent for similar material during 1944; but 9 per cent more than the $60,074,000 expended for rail during 1943. Track fastenings amounted to $61,686,000—a drop of 1 per cent compared with 1945's $62,420,000, while expenditures for switches, frogs, and crossings amounted to $24,580,000—an increase of 13.5 per cent compared with the $21,653,000 spent for similar material during the previous year.

For track and roadway tools of all kinds, motor cars and trailers, miscellaneous track material and wire fencing, the railways spent $10,511,000 in 1946, or almost 16 per cent less than the $12,435,000 spent in the preceding year. Expenditures for ballast amounted to $16,327,000—27 per cent less than the 1945 expenditures, which amounted to $22,287,000. The 1946 expenditure for ballast was 21 per cent less than the $20,582,000 spent for this purpose during 1944 and 16 per cent less than the $19,509,000 expended for similar material during 1943.

More Signaling Installed

In 1946 the railways received $28,987,000 worth of interlocking and signal material—0.04 per cent more than 1945's $28,880,000 and 25 per cent more than the $23,147,000 received in 1943. Purchases of telegraph, telephone and radio material amounted to $6,896,000, or a drop of 10 per cent below the 1945 total, which aggregated $7,695,000. In addition, the roads acquired $28,359,000 of electrical materials, compared with $28,304,000 in the preceding year and $27,338,000 in 1944.

Gross Expenditures for Additions and Betterments to Railway Property† Class I Railways in the United States—Years 1921-1946

Year	Total equipment (000)	Total roadway & structures (000)	Grand Total (000)
1921	$319,874	$237,161	$ 557,035
1922	245,509	183,764	429,273
1923	681,724	377,425	1,059,149
1924	493,609	381,135	874,744
1925	338,114	410,077	748,191
1926	371,922	513,164	885,086
1927	288,701	482,851	771,552
1928	224,301	452,364	676,665
1929	321,306	532,415	853,721
1930	328,269	544,339	872,608
1931	73,105	288,807	361,912
1932	36,371	130,823	167,194
1933	15,454	88,493	103,947
1934	92,005	120,707	212,712
1935	79,335	108,967	188,302
1936	159,104	139,887	298,991
1937	322,877	186,916	509,793
1938	115,408	111,529	226,937
1939	133,388	128,641	262,029
1940	271,906	157,241	429,147
1941	367,568	175,453	543,021
1942	349,374	185,523	534,897
1943	255,981	198,301	454,282
1944	328,231	231,881	560,112
1945	314,779	248,201	562,980
1946	319,017	242,940	561,957

† As compiled by Association of American Railroads.

Since the foregoing purchase figures do not include any expenditures for machinery, apparatus, materials, and supplies purchased for the railroads by contractors engaged in making additions and improvements to Class I railway property, the following data, as compiled by the A.A.R., indicate the extent of this work in 1946 and the value of the materials involved. Gross capital expenditures for roadway and structures last year totaled $242,940,000—a drop of $5,261,000, or 2 per cent below 1945. However, the 1946 total topped the 1944 amount by 5 per cent, surpassed the $198,301,000 expended for the same purpose during 1943 by almost 23 per cent, and exceeded the $185,523,000 spent during 1942 by 31 per cent.

A measure of expenditures for new equipment purchased from manufacturers, for equipment built in railway shops and for improvements to equipment in service, is provided by the recent A.A.R. statement that gross capital expenditures made by Class I railways in 1946 amounted to $319,017,000, an increase of $4,238,000 (or 1 per cent), compared with 1945, but 3 per cent less than similar expenditures in 1944. The 1946 expenditures topped the $255,981,000 spent for the same purpose during 1943 by 25 per cent, but slumped 9 per cent below the 1942 total. Of the 1946 expenditures, approximately 31 per cent went for locomotives, almost 50 per cent for freight-train cars, 15 per cent for passenger train-cars, and the remainder for other equipment.

Capital expenditures for locomotives in 1946 totaled $97,310,000—a decrease of 24 per cent from the $127,934,000 spent for this purpose in the preceding years.

They compare with $178,017,000 in 1944, $142,070,000 in 1943, $113,834,000 in 1942, $80,607,000 in 1941, and $54,351,000 in 1940.

Despite labor strife and critical material shortages, the year 1946 saw an increase of 15 per cent in capital expenditures of $159,282,000 for freight cars — compared with $138,114,000 in 1945, $134,533,000 in 1944, $97,890,000 in 1943, $201,112,000 in 1942, $245,713,000 in pre-war 1941, $189,629,000 in 1940, and $66,779,000 in 1939.

$47,000,000 for Passenger Cars

The most spectacular increase was registered in passenger-train car buying. These expenditures in 1946 amounted to $47,169,000—53 per cent more than the $30,843,000 spent for similar equipment in 1945. The 1946 expenditure surpassed the $1,921,000 spent for passenger-train cars in 1944 by 2,355 per cent, topped 1943's $5,828,000 by 709 per cent, and exceeded the $24,075,000

Gross Capital Expenditures (in Thousands) on Railway Property—1942 to 1946† Class I Railways in the United States

Item	1946	1945	1944	1943	1942
Equipment:					
Locomotives	$ 97,310	$127,934	$178,017	$142,070	$113,834
Freight-train cars	159,282	138,114	134,533	97,890	201,112
Passenger-train cars	47,169	30,843	1,921	5,828	24,075
Other equipment	15,256	17,888	13,760	10,193	10,353
Total Equipment	$319,017	$314,779	$328,231	$255,981	$349,374
Roadway and Structures:					
Additional main track*	$ 14,781	$ 15,566	$ 20,616	$ 18,493	$ 6,235
Yards and sidings	36,427	31,733	36,666	39,254	43,330
Heavier rail	31,545	37,579	35,720	32,227	33,100
Additional ballast	4,960	6,343	6,997	6,229	5,487
Shops and enginehouses (including machinery and tools)	34,289	38,243	28,131	15,615	13,623
Station and office buildings and other station facilities	17,119	14,549	13,433	10,320	10,623
Bridges, trestles and culverts	24,972	24,364	25,088	20,673	21,471
Signals and interlockers, including telephone and telegraph lines, automatic train control, etc.	29,757	30,039	22,091	16,041	16,261
All other improvements	49,090	49,785	43,139	39,449	35,393
Total Roadway and Structures	$242,940	$248,201	$231,881	$198,301	$185,523
Grand Total	$561,957	$562,980	$560,112	$454,282	$534,897

† As compiled by the Association of American Railroads.
* Additional track includes rail and tie fastenings and other track material.

spent for passenger-train cars in 1942 by 96 per cent.

Purchases of other equipment amounted to $15,256,000, a drop of 15 per cent below the $17,888,000 spent for this purpose during the previous year. However, they topped the $13,760,000 expended in 1944 by 11 per cent, exceeded the 1943 total by almost 50 per cent, and surpassed the $10,353,000 spent in 1942 by 47 per cent.

More than $87,000,000 was spent for additions to and the improvement of main tracks and sidings during 1946—$3,000,000 less than was spent for this purpose during 1945 and approximately $12,000,000 less than the $99,999,000 spent for similar work in 1944. Capital expenditures for additional main tracks totaled $14,781,000, or 5 per cent less than the $15,566,000 expended in 1945; slumped 28 per cent ($5,835,000) below the 1944 total; and were 20 per cent less than the $18,493,000 spent for the same purpose in 1943.

Expenditures for the erection of new and the modernization of existing shops and enginehouses amounted to $34,289,000, compared with $38,243,000 in 1945, $28,131,000 in 1944, $15,615,000 in 1943, and $13,623,000 in 1942.

During 1946 the railways spent $24,972,000 for new bridges, trestles and culverts and improvements to existing facilities of this nature—a gain of 2 per cent over the $24,364,000 expended for these purposes during the preceding year. However, the 1946 total was 0.05 per cent ($116,000) less than 1944's $25,088,000. It exceeded the 1943 total ($20,673,000) by 21 per cent, topped the 1942 total ($21,471,000) by 16 per cent, and was 28.5 per cent greater than the $19,419,000 spent for similar purposes during 1941.

Gross Capital Expenditures (in Thousands) on Railway Property—1946 † Class I Railways in the United States)

Item	Unexpended authorizations brought over from 1945 A	Additional authorizations during year 1946 B	Total amount authorized including carry-over from 1945 C= A+B	Amount expended during year 1946 D	Carry-over of unexpended authorization to 1947 E= C–D
Equipment:					
Locomotives	$ 77,453	$126,393	$203,846	$ 97,310	$106,536
Freight-train cars	108,800	217,228	326,028	159,282	166,746
Passenger-train cars	85,753	130,364	216,117	47,169	168,948
Other equipment	7,666	17,254	24,920	15,256	9,664
Total Equipment	$279,672	$491,239	$770,911	$319,017	$451,894
Roadway and Structures:					
Additional main track*	$ 10,518	$ 12,700	$ 23,218	$ 14,781	$ 8,437
Yards and sidings	20,279	40,221	60,500	36,427	24,073
Heavier rail	16,117	39,867	55,984	31,545	24,439
Additional ballast	1,095	5,313	6,408	4,960	1,448
Shops and enginehouses (including machinery and tools)	28,202	38,721	66,923	34,289	32,634
Station and office buildings and other station facilities	12,638	19,487	32,125	17,119	15,006
Bridges, trestles and culverts	29,603	27,373	56,976	24,972	32,004
Signals and interlockers, including telephone and telegraph lines, automatic train control, etc.	27,700	35,365	61,065	29,757	31,308
All other improvements	48,949	65,596	114,545	49,090	65,455
Total Roadway and Structures	$193,101	$284,643	$477,744	$242,940	$234,804
Grand Total	$472,773	$775,882	$1,248,655	$561,957	$686,698

† As compiled by Association of American Railroads.
* Additional track includes rail and tie fastenings and other track material.

Signaling Expenditures

Capital expenditures for signals, interlockers and telephone and telegraph lines totaled $29,757,000—a 1 per cent drop compared with $30,039,000 in 1945. They compare with expenditures of $22,091,000 in 1944, $16,041,000 in 1943, $16,261,000 in 1942 and $13,439,000 in 1941.

Expenditures for improvements to station and office facilities amounted to $17,119,000, almost 18 per cent over last year's. The 1946 total also topped the $13,433,000 spent for this purpose in 1944 by 27 per cent, exceeded 1943's $10,320,000 by 66 per cent, and surpassed the $10,623,000 spent for the same purpose in 1942 by 61 per cent. Capital expenditures for all other improvements during 1946 amounted to $49,090,000, compared with $49,785,000 in 1945, $43,139,000 in 1944, $39,449,000 in 1943, and $35,393,000 in 1942.

* * *

The Metal & Thermit Corp. in South San Francisco, Cal., which normally processes some 6,000 tons of scrap tin per month, recently replaced the two locomotive cranes it had been using for switching with a 25-ton G.-E. Diesel-electric locomotive, powered with a Cummins Diesel 150-hp. Model HBI-600 engine

The two main passenger tracks at South Bend have required very little attention since the asphalt ballast was installed

How Station Track Upkeep Cost Was Cut

New York Central System achieves important economies by installing asphalt ballast, effective drainage and welded rails in two passenger main tracks at South Bend, Ind.

By JOHN R. SCOFIELD

Division Engineer
New York Central System
Chicago

FORMERLY the two main passenger tracks of the New York Central at its South Bend (Ind.) station required an excessive amount of attention by the maintenance forces to keep them in a satisfactory condition. Now, however, as the result of a combination of measures applied in September, 1945, the cost of maintaining these tracks has been greatly reduced. The measures employed included the installation of asphalt-coated ballast, the laying of continuous butt-welded rails and the provision of a drainage system for disposing of surface water.

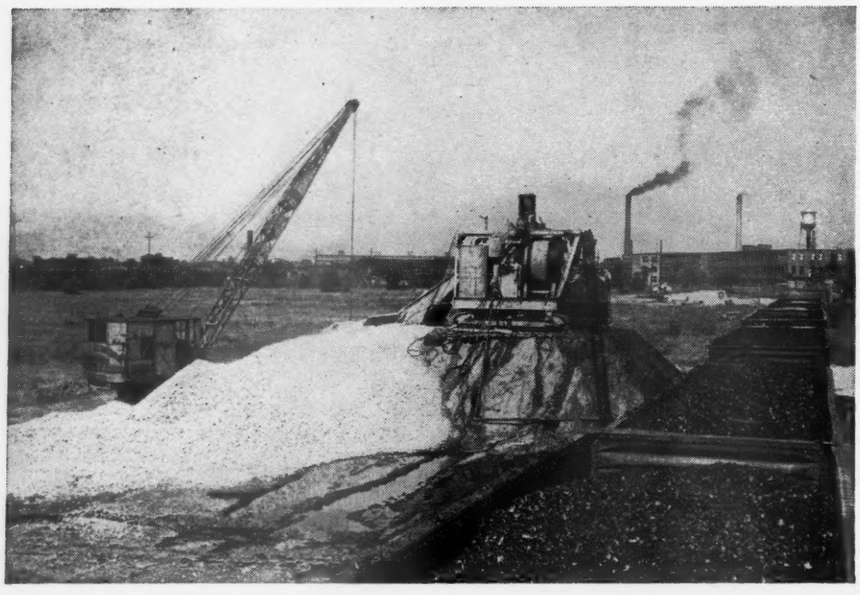
Cause of the Trouble

It is recognized that economical track maintenance requires an efficient drainage system, but proper drainage is difficult to maintain through station areas because of the peculiar conditions that frequently prevail at such locations. Among these is the fact that the locomotive sand, which is applied in considerable amounts, tends to fill the ballast voids and thereby stops the seepage of water through the ballast. Also, the mixture of sand and stone ballast, in the presence of drippings from locomotives and cars, tends to cement itself into an impervious layer. Thus, with drainage blocked, a muddy condition develops which creates a difficult track-maintenance problem, especially at the joints.

This was the situation that prevailed at South Bend before the corrective work was done. The layout through the station area at this point embodies eight tracks, including two passenger mains and two auxiliary passenger tracks, three freight mains and a siding, all carried on a sand fill supported between concrete retaining walls. The two passenger mains are situated between two concrete island platforms, each 1,200 ft. long, with the auxiliary passenger mains lying along the opposite sides of these platforms. At this location, due to the factors mentioned, the two main tracks between the platforms required almost continuous attention to keep them in satisfactory condition.

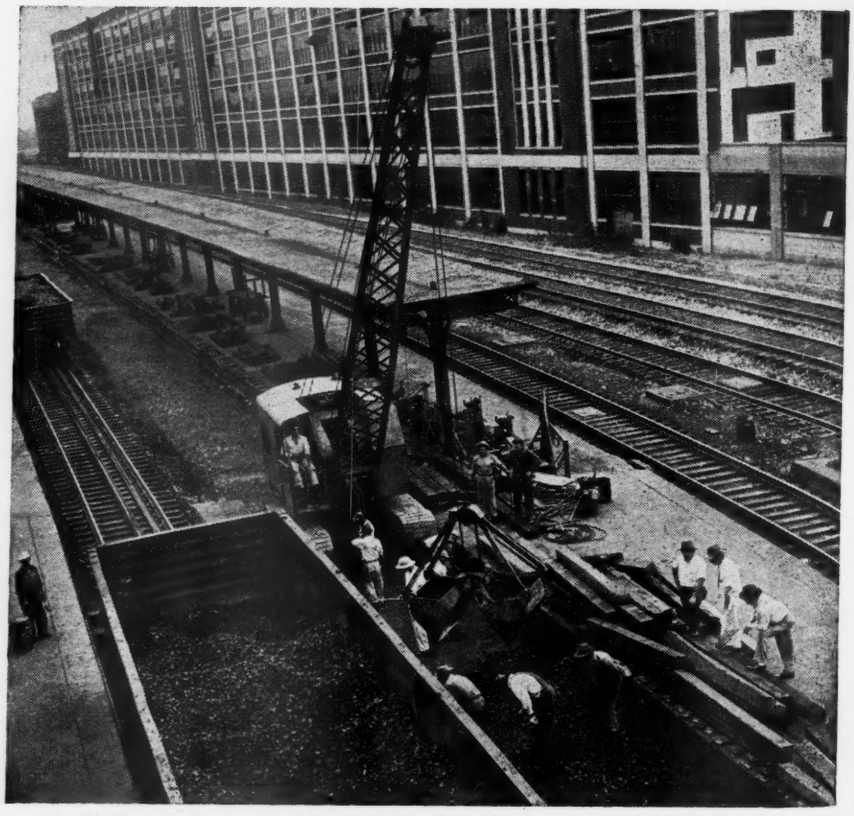
Previous Test Made

For a number of years the New York Central System has been giving careful consideration to the possibilities of correcting bad track conditions in station areas by using ballast coated with emulsified asphalt, the reasoning being that such ballast would be impervious to water and yet could be worked when necessary. As early as 1939 a test installation of such ballast was made in a 600-ft. length of the company's high-speed eastbound main track at Bryan, Ohio. The performance of this test section has been carefully observed by the railroad and by a subcommittee of the Committee on Roadway and Ballast of the American Railway Engineering



Left—The asphalt and ballast were mixed at this temporary plant and hauled to the station site in open top cars

Below — The asphalt-ballast mixture for the first course was unloaded by a crawler-mounted crane



Association, and the results of these observations have been recorded by the committee in its annual reports to the association. In a report made to the convention in 1943, the committee observed that "the track does not heave due to frost; the seal coat sheds water readily, retains foreign matter and prevents it from getting into the ballast. The track in the test section rides well, remains in good line and surface and continues to give satisfactory results with a minimum of expenditure."

Based on the results of the test at Bryan, it was decided to install asphalt-coated ballast in the two main passenger tracks at South Bend for the approximate lengths of the island platforms, employing such refinements as were indicated by experience with the Bryan test. As additional measures to reduce maintenance costs it was decided to eliminate practically all joints in the two tracks at the station by installing continuous butt-welded rails and to provide an efficient drainage system for removing surface water.

In preparation for doing the work an arrangement was made with a contractor to provide a 1-cu. yd. Koehring paver for mixing the ballast and asphalt, the latter consisting of Texaco No. 23 emulsified asphalt. The paver was placed on an elevated dirt ramp so that, after being mixed, the asphalt-coated ballast could be discharged directly into gondola cars on an adjacent track. The mixing plant was located about five miles by rail from the site of the work, and the cars containing the mixture of asphalt and ballast were hauled several at a time to the station location by a switch engine.

To permit the work on the two main passenger tracks to be carried out without interference from traffic, these tracks were taken out of service while the work was under way and all traffic normally carried by them was detoured over the two auxiliary passenger tracks on the opposite sides of the island platforms. Work on the westbound track was done first. After the old rails and ties had been removed from this track, the roadbed, which had become consolidated almost to the hardness of concrete, was excavated to a depth of about 12 in. below the bottoms of the ties, exposing the original sand-fill subgrade. The excavation work was accomplished with the aid of a crawler-mounted dragline outfit, supplemented by a crawler bulldozer, the excavated material being loaded into gondola cars standing on the eastbound track. The subgrade was finished by hand, after which it was compacted to the required elevation by a 10-ton roller.

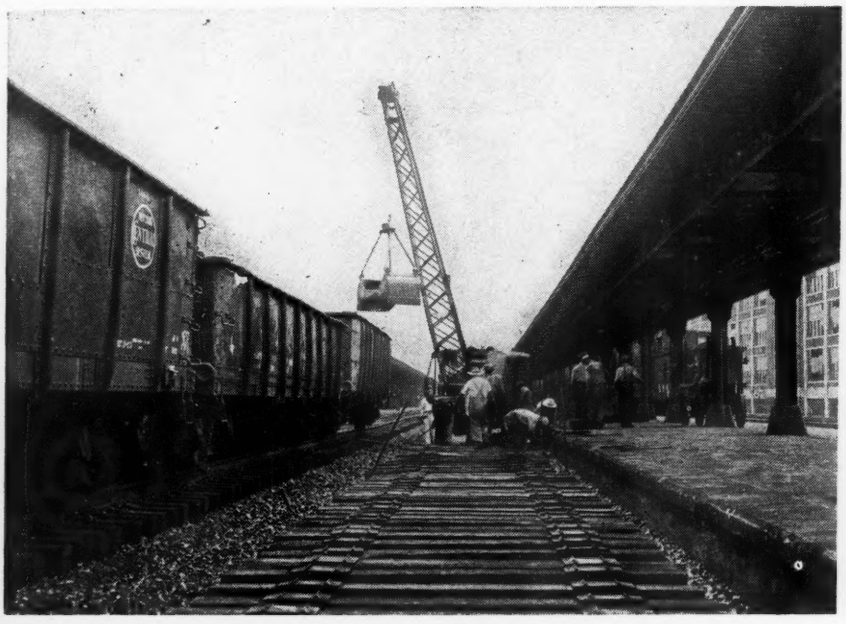
When the subgrade had been fully prepared the asphalt-ballast mixture was unloaded from cars standing on the eastbound track and spread over the subgrade to a depth of 9½ in. The unloading work was done with a crawler crane equipped with a clamshell bucket. The mixture for this part of the ballast section was made in batches of 32 cu. ft., each consisting of two parts of 2-in. stone and one part of ¾-in. graded stone, to which was added an average of 20 gal. of the asphalt emulsion. The crushed stone in the mixture consisted

of a limestone that is regularly used on the New York Central for ballast.

As the asphalt-ballast mixture was unloaded it was carefully leveled. Following closely behind this work new creosoted sawed ties were placed in position on the first course of asphalt ballast. Next, the continuous lines of new 127-lb. butt-welded rail were placed in position on double-shoulder tie plates and fastened with four spikes for each tie plate, including two line spikes and two hold-down spikes. Each rail was made up of two continuous pieces 429 ft. long and one piece 351 ft. long, making a total length of 1,209 ft. Adjoining continuous lengths were connected after laying by conventional six-hole joint bars. Ample provision was made to keep the rails from creeping.

The butt-welds were made at the company's Beech Grove shops at Indianapolis, Ind., by the Oxweld pressure-welding method. After the welding work had been completed the continuous lengths were loaded into strings of open-end gondola cars for transportation to South Bend, about 170 miles. At the site the rails for the westbound track were unloaded onto the eastbound track and then maneuvered into final position by a Burro crane mounted on a car in a work train.

After the westbound track had been rebuilt to the point described above, the procedure was repeated with the eastbound track, using the westbound for loading and unloading material. In the next step the cribs between the ties in both tracks were partially filled with a mixture of ¾-in. graded stone ballast and asphalt emulsion. Each 32-cu. ft. batch of this mixture contained 23 gal. of the emulsion. Each track was then surfaced on a one-inch lift, using pneumatic tampers, after which the cribs were filled to about one half their depth with the ¾-in. asphalt ballast.



Above — New cresoted sawn ties were placed on the first course of the asphalt-ballast mixture

Right—Showing a length of welded rail being maneuvered into position by a Burro crane mounted on a car

The Final Course

Next, a seal coat about two inches thick was applied over the entire ballast area between the platforms, including the inter-track space. This coat was composed of a combination of 25 per cent sand and 75 per cent of ¾-in. stone screenings, thoroughly mixed with asphalt emulsion, and was graded to drain surface water to the inter-track space where a drainage system had previously been provided. A final step, taken to assure that no water would penetrate the surface, consisted of applying over the entire ballast surface a brush coat of a rich mix of sand and asphalt emulsion. When this had been completed, and before traffic was restored over the two tracks, the accumulation of emulsion drippings on the running surfaces of the rails was removed with kerosene and wire brushes, after which a coat of fine sand was deposited on the rails by a work-train engine to complete the cleaning and drying action.

The drainage system that was installed as part of this project embodies nine catch basins covered with metal

Unloading and spreading material for the seal coat

gratings, six of which are located at intervals in the inter-track space. A system of outfall lines connects the catch basins with existing manholes at two street underpasses in the vicinity, which extend under the tracks approximately at the ends of the passenger platforms. To assure rapid run-off of water from the inter-track space, the tops of the catch basins were established at an elevation 16½ in. below the tops of the ties, with the flow line rising in both directions from each catch basin to an elevation of 3 in. below the tops of the ties at the mid-points between catch basins. Thus the difference in elevation between the high points of the flow line in the inter-track space and the tops of the catch basins is 13½ in.

The question has been raised on the New York Central System as to whether a seal coat of asphalt ballast applied over untreated ballast would be effective in overcoming the track-maintenance difficulties ordinarily encountered with station tracks. To determine the answer to this question, short sections of the two main passenger tracks beyond the limits of the island platforms at South Bend were completely reconstructed as part of this project, using a bottom course of regular stone ballast, with no asphalt emulsion added. This untreated ballast was finished to a level two inches below that of the railroad's standard ballast section, after which a two-inch seal coat was applied, which was similar to the seal coat that was placed on the asphalt-ballasted section. The trackage treated in this manner extends a distance of about 220 ft. from each end of the asphalt-ballast section.

Minor Repairs Made

In October, 1946, more than a year after the asphalt-ballast track was installed at South Bend, repairs were made by tamping the track with pneumatic tampers at loose ties and elsewhere as necessary to bring low places back to the original grade. Inequalities in line were also corrected. Additional asphalt-coated screenings were applied where necessary after liquid asphalt had been placed around the ties for sealing purposes. A final seal coat of fine stone chips mixed with cut-back asphalt was then applied over the entire area between the station platforms. A cut-back asphalt was used for this seal coat because it was found to be more resistant to drippings from locomotives and cars than the asphalt emulsion. At the time these repairs were made a small test section was established involving a seal coat of roofing compound, the purpose being to determine the comparative effectiveness of this compound and the cut-back asphalt for the seal coat.

The combination of asphalt ballast, welded rail and good drainage has produced track that requires very little maintenance. In fact, the only attention that the asphalt track has required, other than that mentioned, has been for one man occasionally to pick up debris and trash and to remove piles of sand left by locomotives. This man has also applied liquid asphalt to places where steam drippings have cut through the original emulsified asphalt.

All of the work involved in installing the asphalt-ballast track at South Bend was performed by company forces, except the mixing of the asphalt and ballast, which was done under contract. The work was carried out under the general supervision of F. J. Jerome, then chief engineer of the New York Central System, Lines West of Buffalo. The writer was in direct charge of the work in the field.

Modern Accounting on the New Haven

Work highly mechanized throughout; procedures under constant study to maximize reliability and improve quality of reports while minimizing cost and delay

PART II*

By GEORGE T. CARMICHAEL
Vice-President
New York, New Haven & Hartford

WITH the use of index cards in the handling of vouchers in disbursement accounting, it was found that too much time was lost in removing these cards from the files—not to mention the difficulty in locating the "out" cards when ready reference was necessary. This was especially true of "discount" vouchers which came from the purchasing department in sizeable quantities daily. Cards for a given vendor would be removed and replaced several times during the course of a week.

Old System Outlined

This is the way it worked: the purchasing department would prepare vouchers, as invoices came in bearing a "discount" date; if an additional invoice came in from the same vendor later that day, after the first vouchers had been prepared, then another voucher would be made up. Working under a plan to take advantage of all discounts this could not be overcome. Under that system, in order that it work satisfactorily, it was important that cards be replaced immediately after use, but, during peak periods of the month, there was always a backlog of unreplaced cards. The problem, too, of securing an audit number from loose-leaf cards was annoying. Often it meant searching through the pile of unreplaced cards. With the acquisition of additional companies, the troublesome aspects of the problem were greatly multiplied, because it meant adding twenty loose-leaf binders to those already in use.

The system was cumbersome and in efficient and a completely new plan was ready for installation at the time the war broke out in 1941, but naturally had to be deferred. In 1945, however, conditions were sufficiently improved to adopt the revised system and, accordingly, on July 1 of that year, Tra-Dex equipment was purchased and installed—replacing forty loose-leaf books and dispensing with the necessity of removing and replacing thousands of cards each month.

The new equipment consisted of seven Tra-Dex posting units, with spacers on master dividers, together with indexed guides on a stand. It is a revelation to see how easily and how quickly the new system works; the cards are placed in units and, after the vouchers are numbered and sorted, they are immediately turned over to the operator in alphabetical order. Then the Tra-Dex Unit to be used is moved to the right-hand side of the machine operator, who extracts the card, registers and indexes the voucher, and returns the card immediately to its proper place.

Aside from eliminating a great number of index books, and the added virtue of having cards available for reference at all times, another feature of this equipment is that every card is visible—and when a card is "out," it is so signalled automatically. This prevents lost and misfiled cards. Furthermore, the index trays can be approached from either direction and cards can be removed and replaced without disturbing the operator. At night the units are wheeled into the vault for protection. The use of mechanical devices in this branch of the New Haven's operations is reflected in many directions aside from its primary function. For instance, in the compilation of monthly and annual statistics, preparation of special statements or for ready reference, its value cannot be overestimated.

The New Haven is one of the few railroads obliged by state law to pay its employees on a weekly basis. While this is perhaps desirable from the employees' point of view, it entails considerable paper work for the railroad. Prior to the war, it was a relatively simple matter to determine gross pay and draw the pay check accordingly, but in the past five years, wage schedules have become more complicated.

This is partly due to deductions for health, welfare insurance, and savings the road has encouraged in the interests of its employees, but, additionally, there are the withholding taxes, federal, state and city, and, more recently, a local city tax.

Reducing Clerical Work

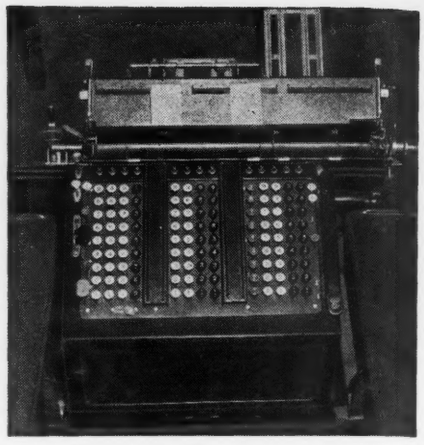
The volume of work in the payroll department has increased to such an extent it has been impossible to obtain sufficient trained personnel to handle it. The condition has been met by simplifying and improving office and accounting procedures, intensifying the supervision, and establishing better controls. The aim has been to reduce to a minimum the amount of clerical work required. The first step in that direction was to select the routine jobs that involved the most clerical help—particularly those jobs that were giving trouble to produce

Newly installed posting units in voucher bureau

* Part I of this article appeared in the *Railway Age* of April 5.

quickly and accurately. These "bottlenecks" were then studied by making a flow chart of the procedure, showing the sequence of operations and the average time it took to complete each operation. Included in this study was a survey of related work that possibly might be combined with the major job in question—thus effecting a saving in time as well as more efficient overall handling. In the course of such an analysis, many needed improvements came to light rather naturally. For example, in studying improved methods of compiling the hours of service and compensation for reporting to the I. C. C., it was soon discovered that this could be done by simply adding our payroll control slips.

It has been our practice to obtain weekly time returns from all employees excepting those in actual train service. For instance, in the case of maintenance of equipment employees, this return consists of a clock card, pre-addressographed as to name and occupation, on which the time worked each day is recorded. At the end of the week, the hours are totaled according to the kind of time—straight time, overtime, and time paid not worked—the totals then being listed in the proper place on the time card, along with the rate to be paid.

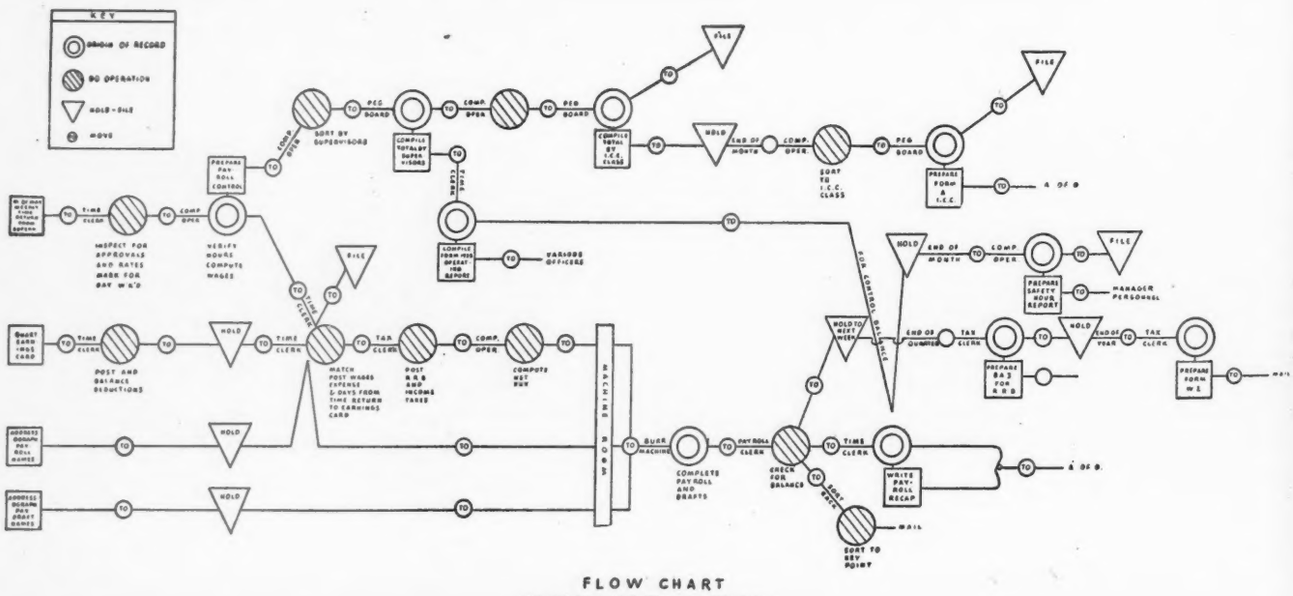


Burroughs payroll machine

Bookkeeping machines in voucher bureau

When time cards are received in the Division accountant's office, they are sorted by occupation and then by rates within each occupation. At that point, the cards are forwarded to the comptometer operators who compute the gross pay due each individual.

The next step is to prepare a payroll control slip (shown in the illustration at the top of page 753)—designed for later use on a peg board—a separate slip being used for each Interstate Commerce Commission occupation classification at each location. The hours for each kind of time for all employees of one classification having the same rate of pay are totaled and entered on one line of the control slip—together with the rate applying. When the hours for all employees for one class have been posted, the hours are totaled and shown on the proper line on the lower part of the slip. The hours indicated on the slip are then multiplied by the corresponding rate, and



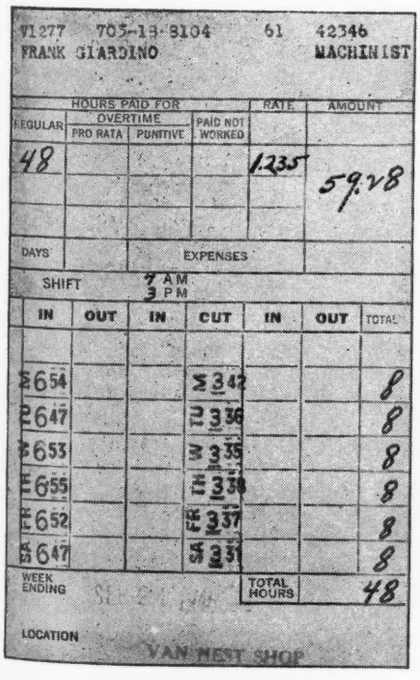
FLOW CHART
MAINTENANCE OF WAY PAYROLL
AND HOURS OF SERVICE

the amount entered on the proper line. Total pay amount as indicated on each slip is balanced to total of individual gross pay amounts as shown on the time cards for the same group of employees—thus proving the individual pay extensions.

While payroll and drafts are being prepared, the control slips are placed on the peg board, by locations without regard to occupation classification, and a total slip is prepared for each location; this establishes a payroll control for each point. These total slips are used in compiling a report for the operating officers and show the number of men, hours paid, amount of overtime, and total wages at each point. Subsequently, at the end of the month, these total slips are used to compile a report of actual hours worked under each supervisor, such information being important to the safety department.

After the payroll is completed, the original detail control slips for all maintenance of equipment employees are sorted according to occupation class and are then placed on the peg board and a total slip is prepared for each class. At the end of the month, the weekly total slips are placed on the peg board, a total for each occupation classification is determined and posted direct to the I. C. C. Form A report. A similar system is in force for maintenance of way employees.

This system of payroll accounting and control has been found most satisfactory on the New Haven. Its two outstanding virtues aside from its time and labor saving features are: (1) errors in pay due to improper calculation have been completely eliminated by one operation; (2) important statistical reports are produced accurately and when needed. The accompanying illustrations showing a few of the steps described will perhaps clarify the overall operation.



V1277 703-18-8104 61 42346
FRANK GIARDINO MACHINIST

HOURS PAID FOR				RATE	AMOUNT
REGULAR	OVERTIME PRO RATA	OVERTIME PUNITIVE	PAID NOT WORKED		
48				1.235	59.28

DAYS EXPENSES

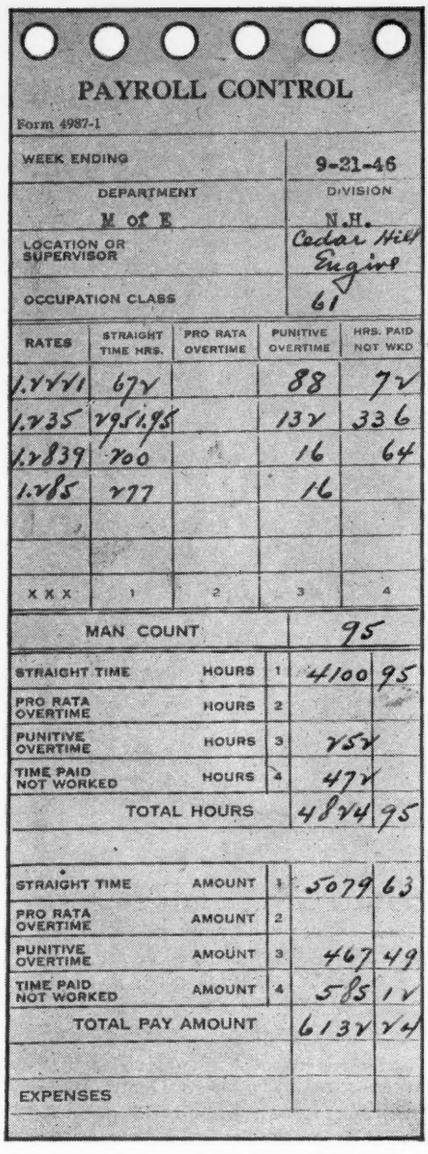
SHIFT 7 AM 3 PM

IN	OUT	IN	CUT	IN	OUT	TOTAL
6 54			3 42			8
6 47			3 36			8
6 53			3 35			8
6 55			3 30			8
6 52			3 37			8
6 47			3 31			8

WEEK ENDING TOTAL HOURS 48

LOCATION VAN NEST SHOP

Maintenance of equipment time card



PAYROLL CONTROL

Form 4987-1

WEEK ENDING	9-21-46
DEPARTMENT M of E	DIVISION N.H.
LOCATION OR SUPERVISOR	Cedar Hill Engine
OCCUPATION CLASS	61

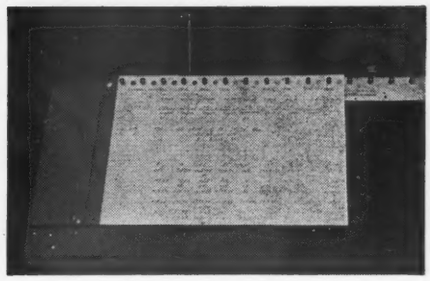
RATES	STRAIGHT TIME HRS.	PRO RATA OVERTIME	PUNITIVE OVERTIME	HRS. PAID NOT WKD
1.1111	67 1/2		8 8	7 1/2
1.1235	795 1.95		13 1/2	33 6
1.1839	7 0 0		16	64
1.1985	7 7 7		16	
X X X	1	2	3	4

MAN COUNT			95
STRAIGHT TIME HOURS	1	4100	95
PRO RATA OVERTIME HOURS	2		
PUNITIVE OVERTIME HOURS	3	7 5 1/2	
TIME PAID NOT WORKED HOURS	4	47 1/2	
TOTAL HOURS		4814	95
STRAIGHT TIME AMOUNT	1	5079	63
PRO RATA OVERTIME AMOUNT	2		
PUNITIVE OVERTIME AMOUNT	3	467	49
TIME PAID NOT WORKED AMOUNT	4	585	1 1/2
TOTAL PAY AMOUNT		6132	1/2
EXPENSES			

Payroll control slip

General

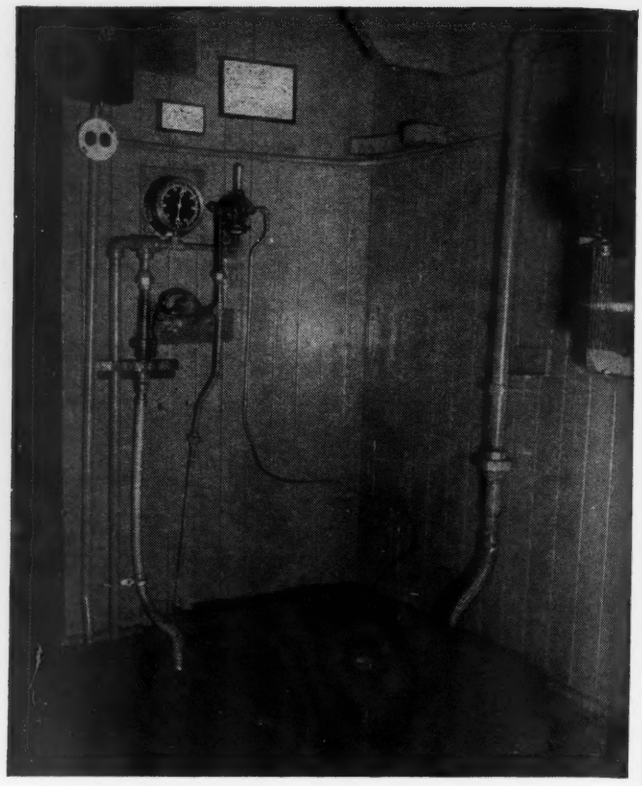
In these days, with higher basic wage rates, and still greater increases in operating and maintenance costs—combined with lower revenues—it is imperative that railroads effect every possible economy in every possible direction, for, paradoxically, management is expected to maintain and improve its record of past accomplishment regardless of the "intake" and the "outgo." If the installation of mechanized time and labor-saving devices means more efficient, more economical methods of operation—which in turn means improved service to our customers—then the New Haven is fully justified in its investment in such equipment.



Peg board for control slips

The improved accounting procedures treated in this article represent but a fraction of the streamlined, mechanized office routines that today are standard practice with the New Haven. This widespread application of modern, mechanical devices has enabled us to expedite our paper work, effect substantial savings in time and money—and, more important, reduce the possibility of error to an absolute minimum. When it is considered that of the 27,000 employees of the New Haven, about 75 per cent are required to do some sort of clerical work daily, it is not surprising that every safeguard is necessary to protect the interest of the employees as well as the road. The management realizes that good equipment like good working conditions is necessary to foster the spirit of teamwork throughout the organization which is so essential to successful operation. With its eye to the future the New Haven will continue to explore the opportunities afforded by improved methods and will adopt them as they become available.

The Illinois Central ran this ad in a large number of newspapers along its lines



Above—The engine and generator in the housing under the caboose—A removable side cover facilitates inspection and maintenance. Right—Interior of the caboose showing the controls, the cover over the engine, and the unit heater at the right

Rock Island Tries Air-Started Caboose Power-Supply Unit

THE Chicago, Rock Island & Pacific now has in operation a caboose power-unit which is designed to meet communication power requirements and 200 watts of lighting load. The unit operates on Diesel fuel oil and averts the need for batteries on the caboose. It consists of a single-cylinder Lister-Blackstone engine running at less than rated speed, driving a 1,500-volt-ampere, 115-volt, single-phase a.c. generator. The engine is started by means of an air starter from the air train line.

Air for starting is secured from the train line through two air chokes, two check valves and an air reservoir. The reservoir pressure is kept at an average of 3 lb. below the air train line pressure. This supplies enough air to start the engine without drawing air from the train line at a rate which would set the air brakes of the train. A rotary air motor is used for starting. It employs a Bendix gear similar to those used on automobiles, which disengages automatically as soon as the speed of the engine flywheel is greater than the speed of the air motor.

A three-way valve is used to control the air for starting and stopping the engine. For starting, the valve is placed in the "start" position for about 5 seconds and then back to the running position. This procedure causes the air to release the cylinder compression, turn on the fuel at the fuel pump and admit air to the air starting motor. The air-starting motor is thus caused to crank the engine for a period of 5 seconds without compression, and for 15 seconds with compression.

The Engine

If the engine has not started during the 20-second starting period, it is necessary to repeat the operation. The three-way valve is also used to stop the engine. When moved to the "stop" position, air is caused to operate the fuel shut-off actuator, which closes the fuel line at the fuel pump.

The engine is rated 8 hp. at 1,200 r.p.m., but is set to operate at 700 r.p.m. It is installed under the floor of the caboose and can also be started with a hand crank from the ground. The a.c. generator is driven from the engine by a V-belt drive at 1,800 r.p.m.

Engine cooling is accomplished by a unit heater having a ⅛ hp., 115-volt, a.c. single-phase motor to drive the fan. This heater is used primarily to eliminate the Diesel engine radiator and thereby simplify the installation underneath the car. It can also be used to heat the car.

No batteries are used in this installation, but the generator is equipped with a d.c. 12-volt winding which may be used for battery starting, either alone or in conjunction with the air-starting motor. The d.c. winding on the generator also will keep a battery charged.

The constant load on the generator consists of the radio equipment and the unit-heater fan motor. This equipment draws approximately 700-volt-amperes. Full lighting load is 200 watts, making a maximum load of 900-volt-amperes on the 1,500-volt-ampere machine. Outlets for electric marker lights are provided on each end of the caboose.

ARABIAN RAILROAD PROJECT IS CONSIDERED FEASIBLE.—The proposed Arabian railroad from Riyadh to Dammam is economically justifiable and feasible, according to a report submitted by an American engineering firm to the government of Saudi Arabia, it has been announced by the United States Department of State. Based on an on-the-spot survey the report estimates the construction cost of the 333-mi. line would be $18,500,000. The railroad is intended to integrate a country in which trade is now handled largely by camel caravans which take approximately 11 days to travel the proposed rail route.

Sees 1947 Capital Expenditures 78.9 Per Cent Above 1946

I. C. C. bureau's "Monthly Comment" also discusses common-stock yields, the trend of passenger business, and the distribution of freight cars

GROSS capital expenditures of Class I railroads in 1947 will be 78.9 per cent in excess of the 1946 expenditures, according to estimates submitted to the Bureau of Transport Economics and Statistics of the Interstate Commerce Commission. The bureau analyzed the estimates in the latest issue of its "Monthly Comment," which also discussed yields on railroad common stocks, the contribution of freight, passenger and other revenues to operating expenses, 1946 passenger indices of the four largest passenger-carrying roads in the East, and the distribution of freight cars by districts.

With figures for 10 roads missing, the estimated gross capital expenditures for 1947 total $944,246,860, as compared with actual 1946 expenditures by the same roads of $527,884,501. The 1946 expenditures exceeded the estimates submitted early last year by about 10 per cent, the bureau reported. The full-year estimates for 1947 were not separated as between anticipated expenditures for road and equipment, but a breakdown on that basis was supplied for the first six months.

[A summary of 1946 capital expenditures appears on page 742 in this issue.—EDITOR.]

71.8 Per Cent for Equipment

The estimate indicated that expenditures for equipment during this year's first half will total $328,683,000, up 179.1 per cent from the total of $117,764,000 spent for equipment during 1946's first half. Meanwhile capital expenditures on road are expected to be up 28.2 per cent, from $100,726,000 to $129,084,000. The percentage distribution of the estimated first-half expenditures in 1947 is 71.8 per cent for equipment and 28.2 per cent for road; in the first half of 1946 the distribution was 53.9 per cent for equipment and 46.1 per cent for road.

The article on common-stock yields brings up-to-date the analysis, with accompanying chart, which was first published a year ago in the "Comment" for April, 1946, as reported in the *Railway Age* of April 13, 1946, page 783. It compares the yield on railroad common stocks with yields on stocks of industrial and public utility companies. The chart covers the period from 1926 through March 12, 1947, the plotted yields having been computed by dividing the prices of the stocks into the dividends paid on them.

As the bureau read it, the chart shows that since the beginning of 1946 the yields on all three types of stocks "have risen sharply, i.e., the prices of all three have declined as compared with their dividends." It also noted the "relatively greater increase in the railroad yields" which "may have been due in part to the uncertainties of earnings in view, of large wage increases and the pending petition for increased rates which was not finally disposed of until shortly before the close of the year." At the same time, attention was called to the showing for the first quarter of this year, when there was a slight rise in the yields of industrial stocks and the yields on rail issues declined.

"Railroad stock yields in the war period and the periods of transition to peace," the bureau continued, "are characterized by a narrower fluctuation than is shown by industrials and utilities. This was not the case in either the Twenties or in the Thirties. From 1942 to the second quarter of 1946, the yields on industrials and utilities declined (i.e., prices relative to dividends rose) much more than the yields on railroad stocks. Whether yields of industrials will continue to rise as compared with railroads in 1947 is, of course, purely a matter of opinion. The January 1-March 12 trends are still superficial in size and possibly in duration as well."

Passenger Traffic

In analyzing the contribution of freight, passenger and other revenues to operating expenses, the bureau set out figures for the first two months of the years 1941, 1944 and 1947, its selection being designed to compare prewar, war and postwar periods. The figures show that, except for the Eastern district in 1947, the freight revenue in each of the territories exceeded total operating expenses in each two-month period of the three years. The Pocahontas region, "because of the nature of its traffic and other factors," showed the highest percentage excess of freight revenue over total expenses—66.7 per cent in 1941, 41.5 per cent in 1944 and 37.8 per cent in 1947.

In each of the territories, however, the 1947 freight revenue percentage of expenses was considerably below that of 1941, the differences ranging from 3.6 percentage points in the Western district to 28.9 points in the Pocahontas region. For Class I roads as a whole, freight revenue exceeded total operating expenses by 15.5 per cent in the first two months of 1941, by 10.4 per cent in 1944, and by only 2 per cent in 1947.

As to the percentage relationship of passenger revenue to total operating expenses, the figures show that this rose to 27.7 per cent in 1944 for Class I roads as a whole; but it fell off to 14.6 per cent in 1947, the same as the 1941 figure. In the Eastern district, Pocahontas region, and Western district the passenger percentage was slightly higher in 1947 than in 1941, but in the Southern region it dropped from 17.7 in 1941 to 15.7 in 1947. On a percentage basis "other revenues" made a smaller contribution to operating expenses in the 1947 period than in 1941 and 1944, the respective percentages for Class I roads as a whole being 9.4, 10.2 and 10.1.

Passenger Indices

The four eastern roads selected for comparison on the basis of 1946 passenger indices were the Pennsylvania, New York Central, New York, New Haven & Hartford and Baltimore & Ohio. In 1946 they produced approximately 79 per cent of both the passenger-miles and passenger revenues of all eastern roads, not including the Pocahontas lines. The indices selected were passengers carried, passenger-miles, miles per passenger, passenger revenue, revenue per passenger, and revenue per passenger-mile; and the 1946 showing was compared with the average of the three years, 1939-41, taken as 100.

"From these indices," the bureau commented, "it appears that, in 1946, the Baltimore & Ohio showed the greatest improvement relative to 1939-1941 in respect to all of the combined indices of coach and first-class business . . . with the single exception of miles per passenger. In the last item the Pennsylvania showed the greatest relative gain. The Pennsylvania also recorded the second greatest gain relative to the base period in four of the other five indices of combined coach and first class business, the New Haven ranking second in revenue per passenger-mile. The Pennsylvania was not only lower than any of the other three roads in revenue per passenger-mile but was also the only one of the four roads which fell

(*Continued on page 779*)

Factors Behind Loss and Damage Increase During 1940-1946

By C. H. DIETRICH

Executive Vice-Chairman
Freight Claim Division
Association of American Railroads

THE carrier- and shipper-sponsored April "Perfect Shipping Campaign" now underway is faced with its two powerful opponents in losses and damages. These adversaries of good shipping "clipped" the Class I railroads in the United States for $94,300,672 in 1946, an increase of 19.7 per cent over 1945. Many shippers and receivers interested in *full-and-good-order* transportation and delivery of their freight are curious to learn what has happened during the past few years to increase the loss and damage figure from $20,152,000 in 1940 to the staggering total recorded in 1946. No single factor is responsible for this extensive increase which has shown a progressive growth, particularly during the years 1942 to 1945, inclusive. There are, however, three major causes, all of which can be broken down into several contributing factors.

War-Induced Difficulties

First, from the outbreak of war in 1941, all transportation activities were directed toward fulfilling the demands of the armed services, without regard to other objectives. This meant, among other things, the pooling of all freight car equipment and the retention in service of all cars that could possibly be used. Repairs were deferred except in connection with safety appliances. The low percentage of cars on their owners' rails militated against the keeping of such equipment in good serviceable condition. All this added up to a great deal of loss and damage by 1946 due to the use of equipment not satisfactory for the commodities being handled.

The second principal factor was the almost complete disappearance of the high-class fiber board from which about 90 per cent of all packages are normally manufactured. This, in turn, resulted in the enforced use by industry of packages that did not do the job. This was true in connection with both carload and less than carload freight, and the axiom that "freight properly and adequately packed and correctly marked is well on its way to a safe delivery at destination" was well exemplified during these war years when freight, as a general rule, was neither adequately packaged nor well marked, and, consequently, got into trouble long before it reached its destination.

The third factor of substantial importance in increasing loss and damage was General Orders 1 and 18 of the Office of Defense Transportation requiring certain minimum weights in both less carload and carload freight substantially above the weights ordinarily loaded prior to the issuance of these orders. This heavier loading of freight would not have been as disastrous from a loss and damage standpoint had the packaging been up to par. But with packages far below their prewar strength and the loading far heavier, it was quite natural that damage due to crushing and package failure generally would follow—and it did.

Also contributing no small part to the growing loss and damage account were long and continuous delays to freight in transit. They did not affect non-perishable freight particularly, but with live stock, fruits, vegetables, melons and other perishable freight, there was a sharp rise in damage due to delays in transit.

In delving into the various contributing factors to this huge loss and damage total, the manpower situation should not be overlooked. Thousands of railroad employees entered the armed services, and it was almost impossible to replace these men and women with experienced or competent people. Many shippers suffering from the same difficulty were unable to pack and prepare their merchandise as securely as formerly. When this deficiency on the part of the shipper was coupled with the lack of trained personnel on the railroads, the result is a combination of circumstances that represents in no small part the reasons for this unprecedented loss and damage account.

Intensive efforts are under way to remedy this loss and damage situation. Scarcely a railroad has failed to take vigorous action through the establishment of special prevention organizations, the employment of trained packaging engineers and added supervision in freight houses and yards. In many other ways they have organized for a reasonably prompt return to normal handling of freight which, in conjunction with the efforts of shippers to eliminate inadequate packaging, will, within a short time, begin to show the desired results.

NEW BOOK . . .

Analysis of Railroad Operations; Second Edition, by Joseph L. White. 306 pages. 9 in. by 6 in. Bound in cloth. Published by Simmons-Boardman Publishing Corporation, 30 Church street, New York 7. Price $5.

With the help of many tables, charts and illustrations, this discussion and interpretation of the accounting classifications established for the railroads by the Interstate Commerce Commission is designed to assist the accountant in understanding the requirements and the viewpoint of the railroad operating man and to guide the less experienced user in the analysis and application of the figures compiled by the accountants. The first edition of this work appeared in 1925, and the revision takes into consideration many changes in railroad practice and in the requirements of regulatory agencies that have occurred since that time.

The author's experience in the preparation and use of railroad statistics, acquired during service on the staffs of railroads and of financial institutions and as an adviser to security holders, has been seasoned by his association with the Federal Coordinator of Transportation and, during the recent war, with the Office of Defense Transportation, for which he was executive officer.

Except for a few changes in arrangement and presentation of material, the plan of the first edition of the book has been adhered to in the revision, but it has been brought up to date of publication in its description and use of I.C.C. accounting rules and statistical practices. As a practical application of the principles of analysis of railroad operations set forth in twenty chapters forming the body of the work, there is a concluding chapter in which is presented in detail a comparative analysis of the operating results of two large railroads, based on their reports to the commission.

COMMUNICATIONS

Sees Railroads Weak in Human Relations

MADISON, N. J.

TO THE EDITOR:

I hope that all of our perspicacious and progressive railroad executives will recognize and ponder over the truths so well expressed in your editorial of February 8, 1947, entitled "Organization Needs Peri-

odic Study." Having accepted your facts, I trust that they will lose no time in having their organizational structure and policies reviewed (and if necessary, overhauled) by a competent and unbiased staff.

Good organization is not an accident, and does not "just happen." It must be carefully planned and balanced, and after having been properly set up, like any other machine, it requires periodic inspection and adjustment. No organization can be better than the individuals who comprise it, and it is imperative that the personnel at all levels on a railroad receive as thorough supervision and maintenance as is given the machinery in the shops, or the locomotives on the road.

To the layman, it is difficult to understand why the railroads, which have made such tremendous technological strides during the past century, have done so little to understand or improve their "Human Relations." Although large sums of money are expended to improve mechanical operations (often for the purpose of eliminating jobs) little has been accomplished in improving (or understanding) the most complex, universal machine ever created—the human being.

Human nature has changed but little during the past century, and everyone from the president down to the lowly trackwalker is motivated by the same basic desires, needs, fears, ambitions, likes or dislikes. No railroad, or any other industry, can operate without "Human Relations," as they comprise dealings with employees, customers, suppliers, stockholders, and the general public. The better the human relations, the better and more prosperous the industry. Good organization recognizes the importance of superlative human relations, as well as the rights and needs of each department of the company.

THOMAS T. TABER

Says Supervisors Should Ride on Steel

TO THE EDITOR:

I'm a chief dispatcher. I have quite a long period of service behind me. The excessive number of serious derailments that have occurred in the past few years might have, as a contributing cause, the present day tendency to mount all the supervisory officers on rubber, so to speak, instead of on steel. In other words—are our trainmasters, traveling engineers and other traveling officers using automobiles too much to do a good job of actual train operation supervision?

There are good arguments for the use of automobiles and highway travel. On most divisions the officers by means of highway travel can get to any point on the division where trouble of some sort has developed within minutes or a few hours. The officer can be available at the division headquarters, handle his work there and yet be able to get out to any trouble spot within a short time.

Even when rail-cars are used—they are rapidly displacing the old-time private car of the division superintendent—the officers riding them do not see and experience train and engine operation in the manner they do when actually riding the engine or caboose.

There is a tendency to have traveling engineers spend most of their time at roundhouses, or in travel by highway from roundhouse to roundhouse. They use company cars or else the company pays them mileage if using their own cars. The traveling engineer should be up on the smokly end of a train a great deal of the time, observing whether the engineers whistle for crossings properly, obey block signals strictly, etc. Many of the "test reports" that division officers are required to make each month are filled in from the train register and the officers' imagination. They don't have time or opportunity to really make the tests.

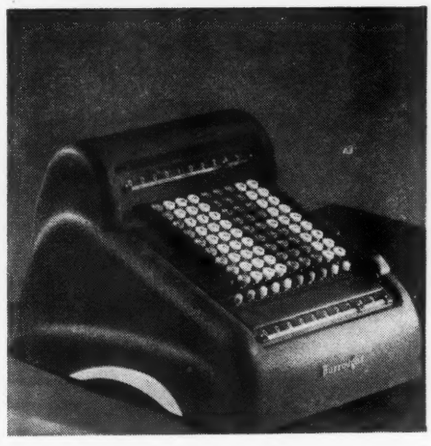
"Investigations" are becoming a terrible problem. Only the most skilled and clever officers of long experience can successfully conduct investigations that will stand up before the legally trained minds that sit in review upon them in the appeal labor boards. It begins to appear that each division shall have to have an officer with both legal training and railroad experience to take care of investigations and other matters pertaining to schedules of the several railroad labor organizations.

Modern trends may well force quite a reorganization of the usual divisional operating staff.

CHIEF DISPATCHER

Burroughs Calculator

The Burroughs electric duplex calculator, one of the restyled line of office machines being produced by the Burroughs Adding Machine Company, Detroit, Mich., is said to offer a number of operating advantages over earlier models and to have application on a wide variety of calculating jobs. The machine is finished in a non-reflecting, soft brown color, while its key tops are treated with harmonizing tones of brown and ivory.



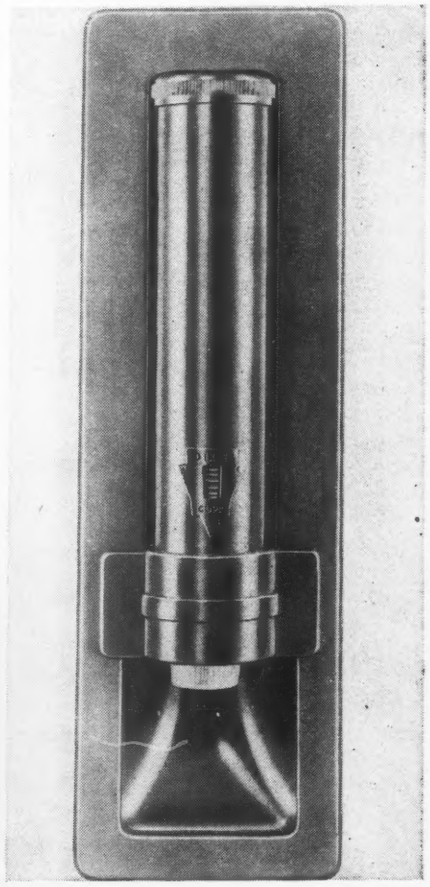
The new Burroughs calculator affords a smart, modern appearance

The front dials register the result of individual calculations; the rear dials automatically accumulate a grand total. It is said that any amount registered in the front dials can be instantly subtracted from the grand total by means of the "subtract" bar, without the use of other keys.

Among other features, it is claimed the unit offers smooth, electric operation; a column lock, preventing the depression of more than one key at a time in the same column; and chromium plated hand grips which allow the machine to be lifted easily.

Cup Dispensers

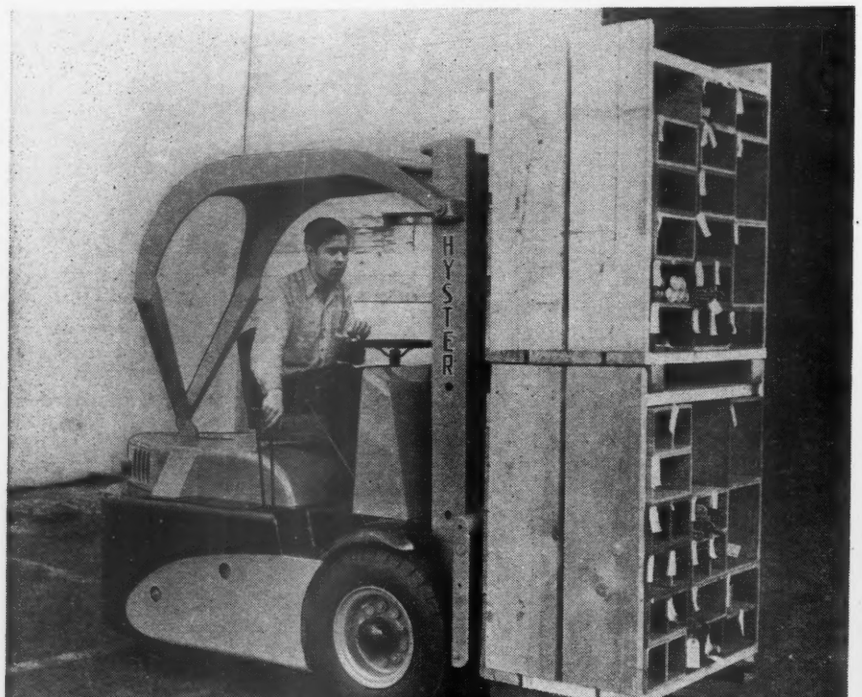
Two drinking-cup dispensers have been designed exclusively for railroad service by the Dixie Cup Company, Easton, Pa. The first of these is a streamlined recessed-type dispenser finished in lustrous satin-chrome that fits flush in the bulkhead.



Recessed-type drinking-cup dispenser

A removable insert allows the quick changing of cups without changing the entire dispenser and makes possible the use of several different-sized flat-bottom Dixie or Vortex cone cups. For easy filling, the cylindrical cup container revolves and closes flush with the walls of the dispenser. The need for refilling is visibly indicated by a clear plastic window.

The second dispenser is designed particularly for roomettes and compartments, and also accommodates several sizes of cups. Both dispensers are the pull-type with no moving parts, and dispense one cup at a time. They are built of sturdy, die-cast metal.



The "Hyster 40"

New Hyster 40 Industrial Lift Truck

Development of a new lift truck termed the "Hyster 40" has been announced by the Hyster Company, Portland, Oregon. This pneumatic-tired truck with a lifting capacity of 4,000 lb. has trunnion steering, said to facilitate maneuverability, and is designed to speed materials handling operations in storehouses or freight depots.

The four cylinder, 4 cycle V-type air-cooled Wisconsin motor, clutch, transmission, differential and brake are combined in a single unit sealed against weather and dirt. A self-lubricated unit which houses pump, valves and reservoir contains the hydraulic mechanism for hoisting and tilting.

The "Hyster 40" has an 11-in. clutch which can be engaged or disengaged without interference to hoisting or tilting operations.

This oversize clutch has a torque capacity of 320 ft. lb. to operate from an engine torque-ability of 57 ft. lb.

Moving channels and carriage of the hoisting mechanism are roller supported, said to be a factor toward eliminating channel friction surfaces.

The one-piece steelshield body, of streamlined design, is also the frame of the "Hyster 40." Equipped with conventional controls of the standard automotive type, facilitating its easy operation, the truck can achieve speeds up to 12 m.p.h. in either direction.

The "Hyster 40," with a lifting range of 9 ft., has load arms adjustable in overall width from 11½ in. to 38 in. to accommodate various sizes of packages or pallet loads. The tilting control link connected at the top of the hoisting mechanism provides control to the load and, in addition, serves as a built-in overhead guard for the operator.

Greater visibility provided through mounting of a single chain cable in front of the hoist cylinder, a conveniently-located full-vision instrument panel and a comfortable, adjustable seat are all features of this unit designed to promote driver efficiency.

"HydroLectric" Handles Heavy Loads

A motorized lift ttruck, identified as the "HydroLectric," is being manufactured by Lift Trucks, Inc., 2425 Spring Grove ave., Cincinnati 14, Ohio. It is said that this new truck can readily move loads up to 4,000 lb. forward and backward and that it can attain speeds up to 300 ft. per min. when empty and 200 ft. per min. when fully loaded. The unit has a finger-tip control, consisting of two pushbuttons on the handle, one for forward motion and one for reverse. The handle has a quick disengaging action from the lifting linkage, while an automatic hookup is provided to permit the unit to lift with the handle in a vertical position.

Power is supplied by a 12-volt series motor with compensating winding and large brush area. The motor has a heavy-duty controller which allows the reversal of the motor current for braking. All standard makes of batteries, equivalent in ratings up to 450 ampere-hours, can be accommodated in the battery cradle. Other features include dual-wheels, which are claimed to permit easier steering, and a self-contained hydraulic ram for compactness and smooth operation of the lift unit. The frame is of malleable steel construction and is bolted throughout. Rear drive wheels, with solid rubber tires for greater traction, measure 9 by 5 in. The HydroLectric has a standard lift of three inches and is available in a standard width of 26¾ in. and two standard platform heights of 9 in. and 11 in.

The HydroLectric lift truck

GENERAL NEWS

Steel Industry Fixes Car-Program Tonnage

O. D. T. not "entirely satisfied," but is "willing to be shown"

The Office of Defense Transportation is not "entirely satisfied" with a recommendation by the so-called Industry Advisory Committee for Distribution of Steel for Freight Cars calling for a pledge by the steel industry of approximately 151,000 tons of steel, including component parts and specialties, for the construction of 10,000 new freight cars monthly in railroad and contract shops. The O. D. T.'s views were set out in a report made public April 3.

According to the report, the steel industry has also agreed to deliver 59,000 tons of steel for the repair of all rolling stock, including freight and passenger cars and locomotives. The total allotment of 210,000 tons, according to the O. D. T., follows to a large extent the breakdown of tonnages prepared by the American Railway Car Institute for cars now on order, but is 29,000 tons less than the 239,000 tons—including 171,000 tons of steel for new cars and 68,000 tons for repairs—recommended by the so-called Car Builders Production Committee.

Builders' Figures Were Disputed—The O. D. T. said that the steel committee, following a meeting in Washington, D. C., last month, "objected at once" to the requirements developed by the car builders committee on the basis that there was "considerable duplication and inflation" in the figures. The report said that the steel industry people "finally compromised" on a figure of about 15.1 tons per car—as compared to the 17.1 tons per car asked by the car builders—after first insisting on a "much lower" figure. The report also disclosed that the car builders' steel requirements were "carried only to the month of August because the . . . builders' shipping schedule indicated a sharp decline after October from the 10,000 car level, pending placement of additional orders in the car shops." Two-months "lead time" was assumed between steel production and completion of cars.

After noting that the steel industry's pledge of 59,000 tons of steel for repair purposes was decided upon "in the light of their experience with steel orders since January," the O. D. T. said that it had hoped the steel committee would agree to increasing May rollings to the "greatest extent possible" and to have the increased rolling made fully effective in June. "The steel committee rejected this request, though it appeared to us to be reasonable and necessary, and decided that increased tonnages would be made available to the greatest extent possible for June rollings and that the program would be placed in full effect in July rollings," the report added.

O. D. T. Is Doubtful—"We are not entirely satisfied with the results of the steel committee's action, but we are willing to be shown that the tonnages they have underwritten are sufficient for the production of 10,000 cars per month and fully adequate for the car repair program, as they contend," the report also said. "We will follow the programs closely to obtain the best possible distribution of these tonnages with the thought that if subsequent experience demonstrates the tonnages to be inadequate, we will insist on enlargements of them where needed.

"We are now establishing a follow-up procedure under which a running record will be kept of tonnages allocated by each steel mill to steel consumers for this program. This record will permit checking on space available for particular steel products in various mills, and through this procedure we hope to assist consumers who are unable to place their orders after exhausting their own efforts so that they can be told where to make further contacts to have orders accepted."

The O. D. T. urged each steel purchaser to make "every effort" to place orders on a minimum basis in the month in which rolling is required in order to meet the car building schedules. It said that the steel companies have been provided with the detailed requirements prepared by the car builders' committee and will thus be in a better position to assess the actual requirements of each participant. "By the same token," the report added, "each participant should keep his request for steel down to the minimum requirements so that the underwritten tonnages will produce maximum results in completed cars."

Untapped Sources—The report also includes excerpts from a March 31 letter addressed to Colonel J. Monroe Johnson, director of the O. D. T., from P. J. Treacy, chief, steel branch, metals and minerals division, Civilian Production Administration of the Office of Temporary Controls.

"It will be noted that there are some steel producers who do not normally sell to car builders or component parts manufacturers, and for this reason would presumably have no historical quotas with this industry," Mr. Treacy said in part. "It also should be emphasized that there are certain producers on the list who may not be located advantageously with respect to the areas in which car building and the manufacture of car components are concentrated.

"However, it is expected that this tonnage can be utilized to some extent by the railroads for their maintenance and repair requirements, and we ask the full consid-

(*Continued on page 763*)

Ask I.C.C. Approval of C. & O.-N.Y.C. Tie

Young, Bowman would join Central board; C. & O. would free stock from trust

Proceeding in accordance with their previously-announced plans, Robert R. Young, chairman of the Chesapeake & Ohio and Alleghany Corporation, and Robert J. Bowman, C. & O. president, last week filed with the Interstate Commerce Commission applications for authority to hold New York Central directorships. At the same time, C. & O. and Alleghany asked the commission to release the 400,000 share of New York Central stock recently acquired by the former from the requirement whereby it has been deposited with the Chase National Bank of New York as independent voting trustee under the trusteeship created pursuant to the commission's June, 1945, decision approving Alleghany's control of the C. & O., New York, Chicago & St. Louis and Pere Marquette.

The June, 1945, decision was in Finance Docket No. 14692. As noted in the *Railway Age* of June 16, 1945, page 1072, the commission's favorable action was subject to a condition requiring Alleghany and C. & O. to deposit with the trustee their holdings in other carriers (except the Missouri Pacific which was undergoing reorganization) and any additional stocks of other carriers which they might acquire.

Would Trustee Nickel Plate — The present petition for modification of that order asks in effect that the C. & O. holdings of Nickel Plate be trusteed instead of its holdings in N. Y. C. After the proposed modification, the applicable condition would read as follows: "Alleghany and the Chesapeake & Ohio shall deposit with the Chase National Bank of New York as independent voting trustee all voting stocks of the New York, Chicago & St. Louis and of other carrier corporations subject to regulation under the Interstate Commerce Act, not at present affiliated with the Chesapeake & Ohio system, whether now owned or hereafter acquired by them, except stock of the New York Central and except Alleghany's holdings of the Missouri Pacific which is now in reorganization under section 77 of the Bankruptcy Act as amended."

Mr. Young's application for authority to join the N. Y. C. board of directors stated that he had been invited to do so and that he had accepted the invitation subject to commission approval. "Investments" is Mr. Young's "occupation," according to the application which also revealed that the applicant owns personally 200 shares

of N. Y. C. common and 110 shares of C. & O. common.

It went on to say that Mr. Young has made investigations and studies whereby he has become "generally familiar with the corporate organization and properties" of the N. Y. C. "Your applicant," it continued, "believes that because of his long experience in an executive capacity with the Chesapeake & Ohio, and with the Alleghany Corporation, and the successful results achieved under his supervision and direction, and that in view of his investigation, study, and knowledge of the New York Central System, and the financial investment of the Chesapeake & Ohio in New York Central and other relationships between them, it is desirable and appropriate that your applicant be authorized to hold the position of director with the New York Central and its subsidiary and affiliated companies."

Call Systems Complementary—A similar presentation was made in the Bowman application. Also, both applications stated that the C. & O. and N. Y. C. are essentially complementary" to each other, the opportunities for "effective competition" between them being "relatively limited."

This contention that the two roads are complementary was developed more fully in the C. & O.-Alleghany petition for modification of the trusteeship requirements. While the petitions argument thus had much to say about prospective benefiits of a C. & O. and Central unification, it conceded that control of the latter has not yet been acquired by the former. "If, at some later date, Chesapeake should acquire control of Central, with the authorization of the commission," the petition said in one place, "it will take suitable steps to dispose of its Nickel Plate shares and discontinue all relations with that company that may have been established by reason of such stock ownership."

Meanwhile, the petition said that the Pocahontas lines had for many years enjoyed a rate of return appreciably higher than that of other major roads in Eastern territory. It added that "the desirability of voluntary unification of these Pocahontas roads with the major trunk line carriers has long been apparent"; and that ultimate unification of the C. & O. and N. Y. C. would be a forward step in the national transportation economy—"just as would a unification, for instance, of the Norfolk & Western with the Pennsylvania, and of the Virginian with some other major carrier, such as the Baltimore & Ohio."

Where C. & O. Got Funds — The C. & O. acquired its N. Y. C. stock at an aggregate cost of $7,593,174.29, an average of $18.98 per share, according to the petition. The transaction, the petition also said, was financed in major part from proceeds from the sale by the C. & O. of its Wheeling & Lake Erie common stock to the Nickel Plate, as authorized recently by the commission. When C. & O. carries out its plans to dispose of other W. & L. E. holdings it will have reimbursed its treasury for the full amount spent in acquiring the N. Y. C. stock.

Supporting its plea for the proposed modification of the trusteeship so that the C. & O. might exercise its "ownership interest" in the Central, the petition described the character of the traffic handled by both roads, pointing out that the C. & O. is predominantly a coal carrier while the bulk of Central's freight business is other than coal. Meanwhile, passenger business on the Central accounts for about a quarter of the gross operating revenues whereas the "normal" passenger proportion of C. & O. revenues is about 3 per cent. "The operations of the lines of these two carriers," the petition continued, "are susceptible of a high degree of traffic coordination which would result in improved service to the public, economies in operation, and improvement in the gross and net incomes of both companies."

Also mentioned was the relative prosperity of the C. & O. which "over a long period of years has proven its capacity to earn a high level of return on propetry investment under the existing rate structure." On the other hand, as the petition put it, Central's "financial structure and its credit standing have been impaired since 1930, by lack of adequate earning power," its rate of return having been "only 2.21 per cent" for the 1939-41 period and 3.4 per cent for the 1942-45 period.

Credit Standings—"Central," the petition went on, "profited by the unusual volume of traffic available during the war period, but its volume of business and revenues fell off sharply in 1946, and it had a net deficit in income of approximately $9,500,000 in that year. Central's impaired credit standing is evidenced by the fact that its refunding and improvement mortgage bonds, which enjoyed a rating of AAA (in Moody's Investors Service) in the 1920's are now rated no better than Ba. Approximately 58 per cent of Central's mortgage bonds are now rated Ba or less, while 41 per cent are rated Baa, and approximately 1 per cent are rated A. The impairment in its credit standing is also manifested by the relatively low prices at which its high interest bearing bonds are selling in the market. At the present time, Central has outstanding $108,000,000 of bonds bearing 5 per cent, $191,000,000 bearing 4½ per cent, $6,000,000 bearing 4½ per cent, and $224,000,000 bearing 4 per cent. Sinking funds have been provided for only two of the 66 outstanding issues of bonds, notes and guaranteed stocks, and these sinking funds are of relatively minor effect."

From the foregoing, the petition proceeded to argue that unification of a "relatively prosperous" railroad with one "not so fortunately situated" was in the public interest, because it tends to provide a sounder basis for attraction of capital and improvement of service. And it was further asserted that no community or district would be deprived of competitive transportation facilities "even if the association presently contemplated should eventually blossom into unification."

I. C. C. Approves Basic Fare Increase for New Haven

The Interstate Commerce Commission has approved the New York, New Haven & Hartford's petition for authority to increase its interstate basic one-way fares in coaches from 2.2 cents to 2.5 cents per mile and in parlor and sleeping cars from 3.3 to 3.5 cents. A similar petition filed subsequently by other Eastern roads is still pending before the commission.

The favorable report in the New Haven case was by Commissioner Rogers and it was confined to the basic-fare proposal, thus leaving the commutation-rate phase for decision later.

"Coffee Hour" on T. & P. Trains

Coffee "on the house" is being served twice daily aboard Texas & Pacific passenger trains equipped with dining cars. Frank Jensen, passenger traffic manager, said that "almost everyone likes a mid-morning and mid-afternoon cup of coffee, especially when they travel, so we are inviting our passengers to be our guests at these two hours." Coffee hours are 10 a.m. and 3 p.m., and will be effective on the "Sunshine Special," the "Louisiana Limited," the "Southerner," and the "Texan."

Museum Needs a Locomotive

A permanent museum, open to the public without charge, is being established at Carillon park, Dayton, Ohio, in which typical transportation equipment will be displayed. A Conestoga wagon, a Concord coach, and a lock representative of the old Miami & Erie canal are among the exhibits. An engine and tender of the type used by the Cincinnati, Hamilton & Dayton around 1850, or any engine of that period, is being sought to round out the collection, and Colonel E. A. Deeds, chairman of the board of the National Cash Register Company, at Dayton, would welcome information about the whereabouts of such an engine.

Carloadings of Year's First 13 Weeks Highest Since '30

Carloadings of this year's first 13 weeks were greater than those of any comparable period since 1930 when there were 500,000 more freight cars in service, it was pointed out this week at the Association of American Railroads. The total loadings for this year's 13-week period were 10,518,015 cars, as compared with 11,269,184 cars for the 1930 period.

An analysis of A.A.R. car-service statistics turned up the fact that each freight car handled an average of siv loads during the first 13 weeks of this year. This compares with the average of five loads handled by each car during the like 1930 period.

Comparisons of the 13-weeks totals of 1947 with those for 1946 and 1945 show that this year's loadings of grain and grain products were 4.5 per cent above last year and 21.6 per cent above 1946. Coal loadings were up 2,1 per cent and 11.7 per cent, respectively, and loadings of forest products were up 27.1 per cent and 18.5 per cent.

Meanwhile loadings of merchandise traffic were down about 1 per cent from last year but up 16 per cent from 1945. Loadings of miscellaneous commodities, on the other hand, were up 12.2 per cent from 1946 but 4.3 per cent below 1945.

Fletcher on Program of U. S. Chamber's Transport Session

R. V. Fletcher, chairman of the Railroad Committee for the Study of Transportation, Association of American Railroads, will discuss the "Railroad Outlook" at the transportation session of the annual meeting of the Chamber of Commerce of the United States, which will be held in Washington, D. C., from April 28 through May 1. The transportation session will be an April 30 luncheon meeting.

Other speakers and their subjects will be J. V. Lawrence, managing director, American Trucking Associations, "Freight Movement in Urban Areas," and Emory S. Land, president, Air Transport Association of America, "Air Transport Prospects and Needs." P. C. Groner, chairman of the chamber's Transportation and Communication Committee, will preside.

Floods Disrupt Train Service in Chicago Area

High water resulting from a 4.4-in. rainfall over the Easter week-end interrupted train service on four lines out of Chicago. Main-line tracks of the Alton were washed out at Lemont, Ill., the night of April 4, and detour operations were commenced over the Santa Fe. Alton train No. 92 with 78 cars (20 cars of perishables) then became stalled on the Santa Fe tracks at Lockport, Ill., when considerable track was washed out from under the cars.

By the morning of April 5 the Alton trackage was restored and the Santa Fe, in turn, started rerouting some of its freight and passenger trains over the Alton between Chicago and Joliet and others over the Burlington between Chicago and Galesburg. Santa Fe trains were restored to normal routing on the evening of April 6.

Pere Marquette passenger trains No. 3 and 6 were annulled April 5 due to washouts at Benton Harbor, Mich. Trains of the Wabash were routed over the Illinois Central and New York Central from Burnham, Ill., to Reddick, 66 mi. south of Chicago, on April 5. Normal routing with slow orders was resumed the following day.

Renew Request for Books for Libraries Overseas

The continued need for American publications to serve as tools of physical and intellectual reconstruction abroad has led to a decision to continue the American Book Center for War Devastated Libraries at least through 1947, and the center is making a renewed appeal for American books and periodicals—for technical and scholarly books and periodicals in all fields and particularly for publications of the past ten years. The support which has been given to the Book Center has made it possible to ship more than 700,000 volumes abroad in the past year. Contributions may be sent to the American Book Center, c/o the Library of Congress, Washington 25, D. C., freight prepaid.

Says Train Travel Will Always Be Cheaper Than Plane

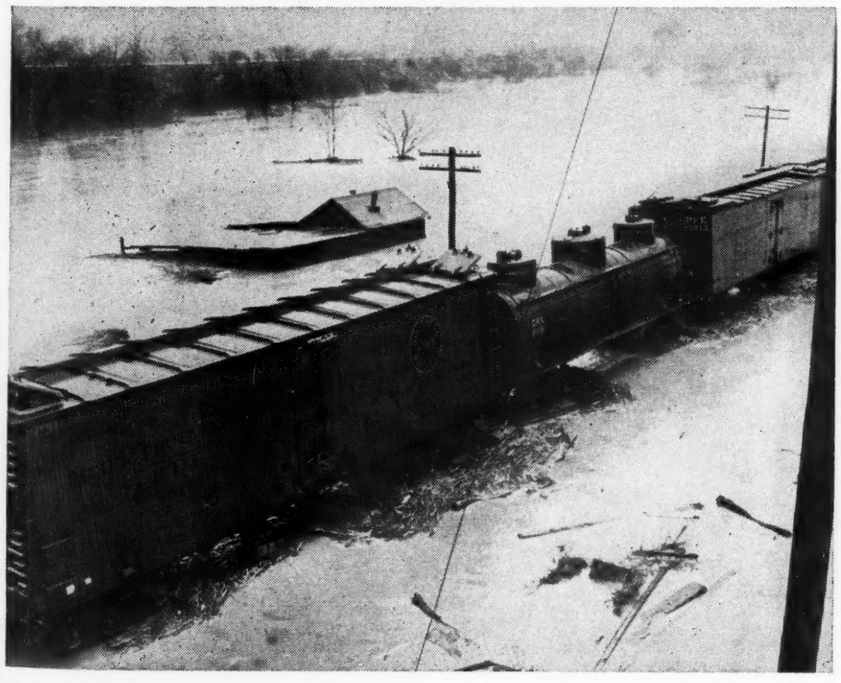
"While many improvements in air line equipment and service can be expected in the years ahead, the railroads probably will maintain a comfortable margin of superiority over air line travel in all respects excepting speed," Harold M. Sims, director of public relations of the Western Association of Railway Executives, declared in an address at Chicago on April 8. Speaking before the Travelers Aid Society of Chicago on the subject, "The Railroads Look at Travel Prospects," Mr. Sims pointed out that the air lines offer a "specialized service," while the railroads meet "a general need on a mass-production basis."

The speaker predicted a travel boom during the years ahead, and added that "the best evidence of confidence that railroads have in the future of travel is the millions of dollars they are putting into new passenger trains." He asserted that the disparity between the cost of train and airplane travel will never be reduced, but that, instead, it will increase in favor of the passenger train. He said that the economy of train travel will become more apparent when the air lines are expected "to assume the responsibilities incident to a grown-up business," with the resultant loss of their subsidies.

Burlington Zephyr Derailed

Two passengers were killed and 37 injured when the "Twin City Zephyr," of the Chicago, Burlington & Quincy, eastbound from Minneapolis, Minn., to Chicago, was derailed and crashed into the Downers Grove (Ill.) passenger station on April 3. The derailment occurred when a tractor fell from a flat car on a westbound freight directly into the path of the speeding streamliner.

The single-unit Diesel locomotive broke away from the train and fell on its side across all three main tracks, the engineer and fireman suffering leg fractures. All of the cars, which were articulated, remained upright, both fatalities occurring at the point where one of the coaches pierced the brick wall of the station, tearing open the side of the car for three window-lengths. A double-ended siding around the passenger station was strengthened and provided a natural "shoo fly" until the main tracks were restored for operation.



Acme Photo

Alton freight No. 92, detouring over the Santa Fe main line, was marooned at Lockport, Ill., by high water and debris from the swollen Illinois-Michigan canal

Retirement Benefits Up Half Million During January

Benefit payments to railroad employees amounted to $13,841,000 during January, an increase of $580,000 over the preceding month, according to the monthly review of the Railroad Retirement Board. During the month, employee-annuity payments increased by $514,000, pension payments declined by $16,000 and death payments rose by $82,000.

New applications for employee annuities totaled 5,500 for the month, as compared with 3,400 applications during December. The deaths of 153 pensioners were reported during the period, reducing the number on the rolls to 14,554. The average pension in force was $59.51.

Unemployment insurance activities in January, for the second successive month, were higher than in any other month since the Railroad Unemployment Insurance Act went into effect. A total of 211,700 claims were filed and benefits certified amounted to $5,677,000. Unemployed workers, most of them registering for the first time in

the current benefit year, filed 28,774 applications for certificate of benefit rights, 28 per cent fewer than in December. An estimated 95,300 railroad workers received payments in January for unemployment in the current benefit year, 10,900 more in the preceding month.

Job openings for unemployed railroad workers declined for the fourth successive month. At the end of January, openings on hand in the board's offices totaled 3,374, or 1,965 fewer than on December 31. The board reported job placements for 830 claimants. Field offices of the board reported 2,572 job placements, a little more than one-half of the December figure.

Freight Car Loadings

Carloading figures for the week ended April 5 were not available when this issue went to press.

Loading of revenue freight for the week ended March 29 totaled 829,412 cars, and the summary for that week as compiled by the Car Service Division, A. A. R., follows:

Revenue Freight Car Loading

For the Week Ended Saturday, March 29

District	1947	1946	1945
Eastern	166,572	165,882	167,641
Allegheny	175,569	182,868	189,834
Pocahontas	60,601	59,645	55,065
Southern	136,929	136,762	133,025
Northwestern	90,055	83,477	89,754
Central Western	132,228	117,738	126,394
Southwestern	67,458	62,770	74,287
Total Western Districts	289,741	263,985	290,435
Total All Roads	829,412	809,142	836,000
Commodities:			
Grain and grain products	51,256	42,631	46,560
Livestock	14,121	15,869	14,521
Coal	174,990	186,217	171,675
Coke	14,362	13,182	15,639
Forest products	50,503	39,508	41,774
Ore	13,222	9,748	22,201
Merchandise l.c.l.	125,134	128,463	112,422
Miscellaneous	385,824	373,524	411,208
March 29	829,412	809,142	836,000
March 22	844,041	804,606	816,741
March 15	841,147	799,906	816,556
March 8	805,789	786,189	767,055
March 1	850,031	782,397	785,736
Cumulative total, 13 weeks	10,518,015	9,732,979	10,078,230

In Canada.—Car loadings for the week ended March 29 totaled 70,203 cars, as compared to 72,486 cars for the previous week and 69,480 cars for the corresponding week last year, according to the compilation of the Dominion Bureau of Statistics.

Totals for Canada:	Revenue Cars Loaded	Total Cars Rec'd from Connections
March 29, 1947	70,203	39,912
March 30, 1947	69,480	37,455
Cumulative totals for Canada		
March 29, 1947	884,969	481,919
March 30, 1947	863,076	458,836

Southern Alters Schedules

New schedules have been announced for the Southern's "Royal Palm" and "Ponce de Leon" between Cincinnati, Ohio, and Florida, the "Queen and Crescent" between Cincinnati and New Orleans, La., and the "Kansas City-Florida Special" between Birmingham, Ala., and Florida, effective April 15. Faster running time has been provided for some of these trains in conjunction with the addition or extension of Diesel-electric operation. The "Ponce de Leon" will leave Cincinnati at 8:15 p.m. (Central Time) and its scheduled arrival at Jacksonville, Fla., will be 7:55 a.m., or 45 min. less running time than at present. The "Kansas City-Florida Special" will leave Jacksonville at 9:30 p.m., 30 min. later than at present, with no change in the arrival time scheduled at Memphis, Tenn., and Kansas City.

Students from 11 U. S. Roads Complete A. U. Course

Representatives of 11 American railroads and the Norwegian State Railroad were among 27 members of the class which completed on April 2 a month's course of the second Rail Transportation Institute conducted by the American University, Washington, D. C., under the direction of Dr. L. M. Homberger. The institute closed with a dinner at the Hotel 2400 in Washington, where certificates were awarded to members of the class by the university's president, Dr. Paul F. Douglass.

The dinner program also included an address by R. V. Fletcher, chairman of the university's board of trustees, who retired on April 1 from the presidency of the Association of American Railroads. The class president, R. E. McGuire of Portsmouth, Ohio, who is assistant superintendent of the Norfolk & Western's Scioto division, introduced the vadedictorian, Lawrence W. Brown, district freight agent, Baltimore & Ohio, Washington, D. C., who spoke for the class. Thomas Burke, mechanical supervisor, Chicago, Rock Island & Pacific, St. Paul, Minn., president of the Rail Transportation Institute Alumni Association, welcomed the new members to the association.

Members of the class, in addition to Messrs. McGuire and Brown, were as follows:

G. W. Blaser, Dumont, N. J., general agent, New York Central; Curtis D. Buford, Shaker Heights, Ohio, inspector of freight transportation, N. Y. C.; Joseph C. Clark, Natrona, Pa.; Daniel W. Connelly, Washington, D. C., traffic manager, Bureau of Ordnance, Navy Department; Robert M. Coultas, Erie, Pa., transportation divisions, General Electric Company; Claude E. Davis, Mt. Morris, Mich., train dispatcher, Pere Marquette; Alphonse D. Denis, Arlington, Va., traffic agent, Illinois Central; John D. Denney, Jr., Columbia, Pa., freight clerk, Reading; Leonard Thomas Dlugosz, Lackawanna, N. Y., demurrage man, Buffalo Creek; Leonard M. Famestad, Sherborn, Mass., demurrage man, Boston & Albany; Vance H. Freygang, Garrett, Ind., assistant trainmaster, B. & O.; Thomas A. Grove, Detroit, Mich., assistant trainmaster, P. M.; A. W. Heimburger, Arlington, Va., passenger representative, B. & O.

Also, Einar Holst, Oslo, Norway, secretary to traffic manager, Norwegian State Railroad; Grant W. Jessup, Olney, Tex., federal transportation specialist (retired), War Department; W. Clyde Keller, Syracuse, N. Y., chief crew dispatcher, N. Y. C.; Robert R. Malinoski, New York, yard brakeman, Erie; Gordon Wright Neal, West Point, Ga., commercial and purchasing agent, Chattahoochee Valley; John P. Ozanich, Buhl, Minn., telegrapher agent, Great Northern; John J. Ohorodnik, Detroit, Mich., transportation inspector, P. M.; Richard J. Peters, Baltimore, Md., accountant, B. & O.; Thomas J. Prendergast, Erie, Pa., locomotive engineer, N. Y. C.;

The class at the American University's second Rail Transportation Institute with Professor Homberger, the director (front row, center)

Manley W. Tobey, Salem, Va., assistant chief rate clerk, N. & W.; Stanley E. Travis, Washington, D. C., military transportation specialist, National Guard Bureau, War Department; Alvan G. Walker, Jr., Roanoke, Va., special apprentice, Motive Power Department, N. & W.

Steel Industry Fixes Car-Program Tonnage

(*Continued from page 759*)

eration of the car builders in purchasing from sources other than those which normally supply them or from areas which may involve in many cases additional freight costs, since it has not been possible to balance the geography of steel manufacture with that of car building and component car manufacturers."

Colonel Johnson, meanwhile, announced last week that he expected the monthly production of new freight cars to reach 10,000 by June. He said that there was no reason why a "vast improvement" should not be made in the production schedules "due to the cooperative spirit shown by the various interests."

$15 Million Long Island Plans Await Fare Increase

A program of improvements on the Long Island involving an expenditure of over $15,000,000 and including the purchase of 50 new passenger cars will be undertaken if the New York State Public Service Commission authorizes the increases in passenger fares now requested by the railroad and provided the commission will continue to work with the railroad to so adjust its fares to cover any further increases in wages and the cost of materials, Walter S. Franklin, vice-president in charge of traffic for the Pennsylvania and the Long Island testified before the commission on April 7.

The Long Island is asking the commission for increases in basic coach fares of 13.63 per cent, or from 2.2 cents a mile to approximately 2.5 cents a mile; in parlor car fares of 6.06 per cent, or from 3.3 cents a mile to about 3.5 cents a mile; a flat increase of $2.50 in the price of monthly commutation tickets, such tickets to good for unlimited monthly use; a flat increase of 65 cents on all 12-trip weekly tickets; and a flat increase of $2 on 46-trip monthly school tickets, or approximately 5 cents a ride.

"In order that the position of the Long Island may be understood," Mr. Franklin said, "I wish to state the program which will be followed if the commission approves the increases: (1) The Long Island agrees to use all its net earnings for the improvement of the property for a period of three years; (2) the road agrees to make such additions and changes in the sub-stations as are required to distribute properly the electrical energy needed to give satisfactory service in the electrically operated area—these improvements to cost approximately $5,000,000 within three years and the installations to be made as soon as practicable; (3) the road agrees to purchase 50 new cars for the electrified area—these cars to be of the new double-deck type, provided the test of the cars in service and about to be delivered proves this type to be satisfactory to the public. The cost of the 50 cars will be approximately $5,500,000.

"In addition, the Long Island will continue the program of installing metal window sash, centralized door control, installation of circulating fans, new seat covers and the completion of the program for ballasting tracks with stone. These improvements are estimated to cost about $4,831,000 and will be completed, if materials can be obtained, within three years. The installation of safety glass, car body insulation and new type springs also will be continued."

Mr. Franklin's appearance before the commission followed by a few days the appearance of a story in the New York Herald-Tribune to the effect that a project was being studied by Otis & Co., Cleveland, Ohio, investment bankers, whereby the Long Island would be linked with the Erie by tunnels under the Hudson and East rivers at New York and a sub-surface line crossing Manhattan to form the connection. A new company with a capitalization of $300 million would be formed to acquire control of the Long Island from the Pennsylvania and construct the connections, according to the newspaper. It was not stated how the financing was to be accomplished. Plans sketched in the article embraced a system of zone fares covering New Jersey and Long Island suburbs and establishment of schedules on a rapid-transit basis at intervals of 10 minutes or so.

Sharon Steel to Make "Cor-Ten"

The Carnegie-Illinois Steel Corporation, a subsidiary of the United States Steel Corporation, announced last week that the Sharon Steel Corporation had been licensed to manufacture "Cor-Ten," the corrosion-resistant, high-strength, low-alloy steel developed by Carnegie-Illinois.

U. P. Coal Mine High in Safety

The coal mine of the Union Pacific Coal Company (a subsidiary of the Union Pacific), at Stansbury, Wyo., has been awarded a "perfect" safety rating by the Bureau of Mines of the Department of the Interior, the road has announced. During 22 years of safety awards, the U. P. subsidiary has been honored eight times, it was asserted.

O.K.'s Stock Issues to Complete Purchase of "Q" Bus Line

Division 4 of the Interstate Commerce Commission has authorized American Buslines to issue additional stock for the purpose of financing its acquisition of the remaining 49 per cent of Burlington Transportation Company stock from the Chicago, Burlington & Quincy. American had previously acquired a 51 per cent interest in the former C. B. & Q. bus-operating subsidiary, and the remaining 49 per cent will be acquired pursuant to a December 31, 1946, agreement for $1,392,700.

The stock issues approved by the commission will consist of 41,655 shares of no-par common to be sold at $30 a share and 10,413 shares of preferred to be sold at par—$100 per share. The proceeds, in addition to the amount required for acquisition of the Burlington stock, will be applied to the discharge of debts and the replenishment of general cash funds.

I. C. C. Finds High-Speed Caused "Red Arrow" Smash

"Excessive speed on a curve" caused the February 18 derailment of the Pennsylvania's eastbound "Red Arrow" near Gallitzin, Pa., according to the report of an Interstate Commerce Commission investigation conducted under the supervision of Commissioner Patterson. The accident resulted in the death of 15 passengers, 6 railway-mail clerks and 3 train-service employees, and the injury of 121 passengers, 4 railway-mail clerks, 7 Pullman employees, 4 dining-car employees and 2 train-service employees.

It occurred on an 8-deg. 30 min. curve, and the commission report estimated that the speed of the Detroit-New York and Washington passenger train was "in excess of 65 m.p.h.," the speed limit on the curve being 30 m.p.h. Commission investigators found no condition of equipment or track which could have contributed to the cause of derailment, and the report cited testimony of a P. R. R. division engineer who said that the theoretical overturning speed of the train's two locomotives was 65.1 m.p.h. "It appears," the report added, "that the train was moving at overturning speed, as the engines overturned to the outside of the curve without marking the rails, and slid on their left sides to the point where they stopped."

Descending Grade——The point of derailment was 1.18 miles east of the east portal of Gallitzin tunnel and 9.97 miles west of Altoona, on a four-track section of the Pittsburgh-Altoona line where trains moving with the current of traffic are operated by automatic block-signal and cab-signal indications. The main tracks from south to north are designated No. 1, eastward freight, No. 2, eastward passenger, No. 3 westward freight, and No. 4, westward passenger. The accident occurred on track No. 2 where the approach from the west is over a 1 deg. 30 min. curve to the left 1,965 ft. in length, a tangent 1,024 ft., a 30 min. curve to the right 255 ft., a tangent 1,031 ft., and the 8 deg. 30 min. curve to the right 190 ft. to the point of derailment and 950 ft. eastward. The grade for eastbound trains is descending, and it varies between 1.42 per cent and 2.36 per cent throughout a distance of 1.74 miles immediately west of the point of accident, where it is 1.73 per cent.

On the curve involved, the structure of track No. 2 consists of 130-lb. rail, rolled in 1929, cropped to 35 ft. in length, and relaid in August, 1946, on an average of 21 treated hardwood ties to the rail length. It is fully tieplated, with double-shoulder tieplates spiked with 5 spikes per tieplate and provided with 6-hole angle bars and 8 rail anchors per rail length. It is ballasted with crushed stone to a depth of 36 in. The specified superelevation on the curve was 3½ in., and the gage varied between 4 ft. 8⅜ in. and 4 ft. 8⅞ in. At the point of derailment the superelevation was 3⅛ in.

and the gage was 4 ft. 8⅞ in. The west 250 ft. of track on the curve is laid in a rock cut, the walls of which rise to a maximum height of about 30 ft. The remainder of the track on the curve is laid on a 92-ft. fill, the base of which is 370 ft. wide.

Brake Test Required—Semi-automatic signal 50R, governing eastbound movements on track No. 2, is 1,052 ft. west of the point of accident. A flange-oiling device and the west end of the circuit of a track speed-recording device are located, respectively, 720 ft. and 800 ft. east of signal 50R, the circuit of the speed-recording device being about 0.2 miles long. Timetable instructions require enginemen of eastbound passenger trains to make a running test of the air brakes "just before passing over the summit east of AR," a tower just west of the station at Gallitzin.

The consist of the "Red Arrow," or No. 68 as it was identified in the report, was two steam locomotives of the 4-6-2 type and 14 cars in the following order: 1 baggage-mail car, 1 passenger-baggage car, 1 coach, 2 sleeping cars, 1 dining car, 6 sleeping cars, 1 coach, and 1 baggage-express car. The ninth, eleventh and thirteenth cars were of lightweight, stainless-steel construction, and the remainder were of "conventional standard all-steel" construction.

The train was running behind schedule, having been 56 min. late when it departed from Pittsburgh at 1:05 a.m., and 1 hr. 3 min. late when it passed AR, the last open office. It then passed signal 50R which displayed proceed, and the derailment occurred when the speed was estimated to have been "in excess of 65 m.p.h.," as noted above. This was about 3:21 a.m. when the weather was "hazy."

Derailed Equipment—Both engines, the first 10 cars and the front truck of the eleventh car were derailed. The two locomotives and their tenders overturned to the left and stopped about 400 ft. east of the point of derailment and at the foot of the 92-ft. embankment of the fill. The engine cabs were "demolished," the steam pipes in them broken, and the engines otherwise "badly damaged," as were the tenders.

The first car stopped on its left side down the embankment, with its front end 425 ft. east of the point of derailment and 96 ft. north of track No. 2. It was "practically demolished." The second car, "badly damaged," stopped on its left side, across tracks Nos. 3 and 4, at a point 481 ft. east of the point of derailment. The third car stopped with the front end on top of the first car and the rear end on track No. 4; its top was "crushed inward to the belt rail" and it was otherwise "badly damaged." The fourth car stopped on its left side and on top of the tender of the first engine; it was "practically demolished." The fifth car, "badly damaged," stopped upright, about 8 ft. west of the second engine and in line with it. The sixth car, also "badly damaged," stopped on its left side down the embankment, with the front end 397 ft. east of the point of derailment and 200 ft. north of track No. 2. The seventh car, which was "considerably damaged," stopped upright on the roadbed with the front end 304 ft. east of the point of derailment and 89 ft. north of track No. 2. The eighth, ninth and tenth cars remained coupled and stopped upright across tracks Nos. 2, 3 and 4, with the front end of the eighth car 23 ft. north of track No. 2 and the rear end of the tenth car between tracks Nos. 2 and 3. These cars were "more or less damaged."

Safe Speed Limits—The report went on to give various specifications of the two engines, saying that the center of gravity of each was 80 in. above the tops of the rails, while the center of gravity of each tender, with the calculated amount of fuel and water at the time of the accident, was 61.4 in. above the tops of the rails. "The equilibrium, safe and overturning speeds for these engines moving on an 8 deg. 30 min. curve having a superelevation of 3½ in. are, respectively, 25, 42.9 and 65.1 m.p.h.," the report added. "The equilibrium, safe and overturning speeds of the tenders on the curve are, respectively, 25, 46.2 and 73.2 m.p.h." Tests after the accident indicated that the train's brakes were functioning properly.

The engineer of the first engine survived, while his fireman and both members of the second engine's crew were killed. He said that he estimated the speed of the train at about 25 m.p.h. when his engine was in the vicinity of the apex of the grade, and that he made a running test of the brakes in this vicinity. He stated further that when his engine was at a point about 3,000 ft. eastward the speed was about 30 m.p.h., and he made an 8-lb. brake-pipe reduction.

"Additional brake-pipe reductions totaling 8 lbs.," the report continued, "were made throughout a distance of about 1,500 ft. immediately eastward. This brake application was not released, and he estimated the speed as about 22 m.p.h. when his engine reached a point about 2,500 ft. west of the west end of the curve. At this point he moved the automatic brake valve to release position momentarily, then placed the valve in lap position to effect a graduated release of the train brakes. He estimated the speed as about 31 m.p.h. when his engine was in the vicinity of signal 50R, and he made a 2-lb. brake-pipe reduction.

Throttle "Became Unlatched" — "Throughout this territory the brakes of the engines and the tenders were not applied. He thought this action was sufficient to control the speed in accordance with the authorized speed for the curve. He said that as his engine entered the curve the throttle lever became unlatched and moved on the quadrant to about half-open position. At that time he was looking forward with his head outside the cab window and when he heard the engine exhausting steam he immediately moved the throttle lever to a closed position. The throttle lever was in open position only a few seconds, and he did not think that slack action of any consequence resulted. He was not aware of anything being wrong until the engine overturned, then he moved the brake valve to emergency position."

Meanwhile the conductor and flagman said that a service application of the brakes was made, as required by the operating rules, in the vicinity of the summit east of AR. The further testimony of these employees was that the brakes were then released and "soon afterward" again applied in service application; and "they thought that this application was not released." The front brakeman "said that he did not observe any application of the brakes in this vicinity prior to the time the brakes became applied in emergency when the derailment occurred." All three of these employees agreed that the cars had been "riding smoothly" prior to the accident, and they "thought" the speed of their train was about 30 m.p.h. when the derailment occurred.

The enginemen of two engines, which were standing at the rear of a westbound freight train on track No. 3 about 1,900 ft. west of the point of accident, said that when No. 68 passed the location of their engines, its speed was "at least 45 or 50 m.p.h." The fireman of one of these engines said that he observed sparks flying from brake shoes at intermittent locations throughout the cars of No. 68, but that no sparks appeared at the brakeshoe locations on the engines or the tenders. A road foreman of engines said that these observations "indicated that a brake application had been partially released at that time," and he added that "such action would be most unusual."

Speed Recorder on Curve—The report also records the road foreman's outline of proper braking procedures in the territory involved, and his testimony to the effect that disciplinary action is taken against enginemen whose trains are shown by the speed-recording device to have been operated in excess of the limit for the curve. A check on the performance of the surviving engineer, during the six-month period prior to the accident, disclosed that in three instances his speed throughout the curve was 30 m.p.h., while it averaged between 15 and 28 m.p.h. on the remainder of his trips. A check of all train movements during a period of 30 days prior to the accident disclosed that in one instance a train moved on the curve at a speed of 31.3 m.p.h., but the average speed of trains during the period was about 20 m.p.h.

On the trip involved, the "Red Arrow" had traversed a distance of only 252 ft. of the speed-recorder circuit, and thus the device did not record its speed. Neither of its engines was equipped with a speedometer.

As indicated above, the commission investigators found no evidence of defective equipment or track. "Examination of track No. 2 throughout a distance of one mile immediately west of the point of accident," the report said, "disclosed that the surface, gage and alinement were well maintained for the maximum authorized speed. There was no mark on the track structure indicating dragging equipment, or any obstruction having been on the track." Also, it was pointed out that two eastbound engines, coupled and moving light, passed over the track at a speed of 25 m.p.h. about 10 min. before the derailment occurred, and "there was no indication of defective track."

"The first indication of any displacement of the structure of track No. 2," the report continued, "was at a point 305 ft.

east of the point of spiral and 190 ft. east of the point of full curvature. At this point the high rail was canted outward and the degree of cant progressively increased until the rail was broken at a point 65 ft. eastward. The succeeding rails throughout a distance of 240 ft. were off the ends of the ties. There were heavy compression burns on the top edge of the gage side of the canted rail, which condition indicated that extraordinary force had been exerted against this rail by the throats of the wheel flanges. . . . There was no wheel mark on any portion of the structure of track No. 2 immediately west of the point of derailment. There were no marks on the wheels of the engines and tenders indicating that they had been in abnormal contact with the track structure."

U. S. Steel Price Changes Hinge on Labor Talks

Continued reports that reductions in steel prices are about to be announced by the United States Steel Corporation "call for some comment on our part so that customers and others interested may be advised of the actual situation," Benjamin F. Fairless, president of the company, said last week. "Collective bargaining negotiations are now in progress between our steel making subsidiaries and the United Steelworkers of America-C. I. O. looking toward the negotiation of new labor contracts to replace those expiring on April 20. One of the demands of the union is for 'a substantial wage increase.' Other demands of the union, if granted, would add materially to our already heavy costs. Until these demands are disposed of in the pending negotiations, no real consideration can be given by us to the adequacy or inadequacy of our present steel prices."

W. A. A. Disposes of Plantation Pipe Line Extension

The 180-mile Plantation Pipe Line Extension, built as a war measure to carry petroleum products from Greensboro, N. C., to Richmond, Va., has been sold by the War Assets Administration to the Keystone Pipe Line Co., Philadelphia, Pa., for $492,940 cash. The purchaser plans to relocate the line for use in connection with other operations. The extension has not been used since the end of the war.

Rate Increases Proposed by Rail and Water Carriers

Responding to the Interstate Commerce Commission "directive" requiring them to submit proposals for adjustment of their water-competitive rates, the railroads have offered to raise transcontinental rates on the commodities involved by the amount of the full 25 per cent increase sought but not granted in the Ex Parte 162 case. Meanwhile the water carriers have advised that they will advance their intercoastal rates proportionately, although they favor greater increases.

As noted in the *Railway Age* of March 22, page 624, the commission "directive" required the railroads and water carriers to confer on the matter of adjusting their competitive rate set-up, and to make public by April 7 proposals in the form of suggested rates which they would be prepared to defend as just and reasonable. The rates involved are those in issue in No. 29663, Transcontinental Rail Rates, No. 29664, Intercoastal Water Rates, and No. 29708, All-Water, Water-Rail and Rail-Water Rates between Pacific Coast Ports and Interior Points.

The railroad proposal was made public by H. C. Barron, counsel for the respondent roads, while water-carrier proposals included those of the Intercoastal Steamship Freight Association and the Gulf Intercoastal Freight Association. The specific adjustments proposed to be made by the railroads were set out in a 15-page statement. The water carriers made public a similar statement showing not only the corresponding adjustments which they are prepared to make but also the rates they would like to publish if the rail rates were to be made still higher than the railroads propose to advance them.

The proceedings have been assigned by the commission for hearing before Commissioner Alldredge at Washington, D. C., on April 22. The commission "directive" requiring the respondent rail and water carriers to confer and submit their proposals stipulated that "nothing done as a result of such a conference shall bind the commission in any way."

Equipment and Supplies

Railroad Diesel Locomotive Inventory December 31

According to statistics compiled by *Railway Age*, there were 5,109 Diesel locomotive units in service on domestic railroads as of December 31, 1946, of which 4,579 were owned by Class I railroads, excluding switching and terminal companies. Class I railroads were operating 1,971 Diesel road locomotive units having a total of 2,976,550 hp. and 2,608 switchers with a total of 2,137,520 hp.

The Diesel locomotive inventory of Class I roads was increased in 1946 by 632 units, of which 1 was 3,000 hp., 121 were 2,000 hp., 236 were 1,350 or 1,500 hp. and the remainder 1,000 hp. or less.

Diesel Locomotive Units in Service—Class I Railways

	Freight Locomotive Units		Passenger and Comb. Pass. & Frt. Locomotive Units		Total	
Horsepower	No.	Total Hp.	No.	Total Hp.	No.	Total Hp.
3,000	1	3,000	...	.....	1	3,000
2,000	5	10,000	485	970,000	490	980,000
1,800	...	.....	37	66,600	37	66,600
1,350 or 1,500	1,182	1,612,050	150	213,240	1,332	1,825,290
1,200	...	.....	19	22,800	19	22,800
1,000	40	40,000	24	24,000	64	64,000
Less than 1,000	22	10,900	6	3,960	28	14,860
Total Road Loco. Units	1,250	1,675,950	721	1,300,600	1,971	2,976,550
Switching Loco. Units	(Averaging approx. 820 hp. per unit)				2,608	2,137,520
Total Road & Switching Loco. Units					4,579	5,114,070

Note:—530 Diesel locomotive units of 407,510 horsepower are estimated to be in service on switching and terminal companies and on Class II and III railroads.

FREIGHT CARS

Freight Cars Delivered Last Month Totaled 2,883

Freight cars delivered to domestic railroads during March totaled 2,883, including 444 from railroad shops, S. M. Felton, president of the American Railway Car Institute, has announced. Deliveries in February amounted to 2,293 freight cars, including 509 from railroad shops. Orders for 12,049 freight cars, including 2,351 ordered from railroad shops, were placed last month, compared with February orders for 13,729 cars, including 1,435 cars ordered from railroad shops.

"The backlog of freight car orders, more than double the figure a year ago, now stands at 94,947, including 22,914 on order from railroad shops," Mr. Felton said. "Of cars now on order 55,778 are box cars and 26,627 are hoppers, the types most needed to reduce the present acute car shortage. There is strong evidence that March marked the turning point in freight car production and that deliveries can now rise rapidly in direct proportion to the additional steel to be made available for car building by the steel industry."

The NEW YORK CENTRAL is inquiring for 2,000 50-ton 40-ft. box cars.

The report in the *Railway Age* for March 29 that the BANGOR & AROOSTOOK is inquiring for 150 50-ton gondola cars was erroneous.

The DENVER & RIO GRANDE WESTERN has ordered 500 50-ton gondolas from the Pressed Steel Car Company. The inquiry for this equipment was reported in the *Railway Age* for February 15.

Five hundred new 50-ton steel box cars to be delivered to the ERIE in June will include a loading device invented and patented by H. D. Barber, that road's vice-president of operation, according to an announcement by the railroad. The new cars incorporate strips of steel along the side walls to which cleats flush with the walls have been welded. With this addition, steel strapping or wire can be threaded through the lugs to hold shipments tightly in place and prevent shifting or moving while in transit.

SIGNALING

The UNION SWITCH & SIGNAL Co. is furnishing cab signal and train control

equipment for installation on nine new Diesel-electric locomotives being built for the Union Pacific. This is continuous two-indication speed control and intermittent magnetic automatic stop equipment for installation on locomotives operating between Chicago and the West coast.

Supply Trade

Pressed Steel Car Backlog Over $52 Million

The Pressed Steel Car Company has a current backlog of orders for freight and industrial cars and parts totaling approximately $52,103,000, Ernest Murphy, president, told stockholders at the annual meeting last week. This compares with a backlog of $47,750,000 at the end of the year. (See the *Railway Age* for March 15, page 574).

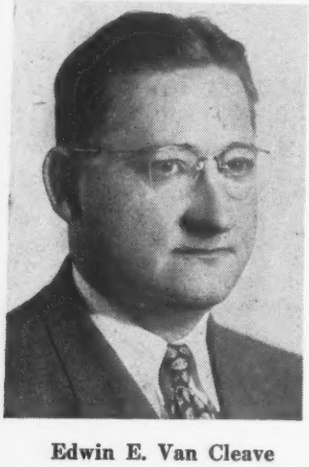
At a meeting of the board of directors following the stockholders' meeting, **C. S. Hanley** was appointed assistant to the president to succeed the late J. J. Moran. All present officers and directors of the firm were reelected.

Ray J. Armbrush, service engineer of the **Vapor Car Heating Company,** Chicago, has been appointed sales representative of the company's Chicago office.

A. J. Fischer has been appointed manager of the carbide and cast alloy division of the **Jessop Steel Company,** Washington, Pa. He formerly was assistant to the supervisor of carbide production for the Firth-Sterling Steel Company.

The **Independent Pneumatic Tool Company** of Chicago, manufacturers of Thor tools, has announced the opening of a technical office at Sao Paulo, Brazil. **Reuben P. Rudy,** former Thor representative in Brazil, has been appointed manager of the new office.

Edwin E. Van Cleave has been appointed sales engineer for the railway equipment division of the **American Welding & Manufacturing Co.,** Warren, Ohio. Mr. Van Cleave will handle railroad equipment applications in the Chicago district, with headquarters at 332 South Michigan avenue.



Edwin E. Van Cleave

The Nathan Manufacturing Company, New York, has announced the promotion of **Richard H. Jenkins** to vice-president in charge of sales and of **John D. Spaulding** to vice-president in charge of production.

Richard H. Jenkins

Mr. Jenkins received his engineering training at the Virginia Mechanics Institute. He served his apprenticeship in the Southern Railway shops, where he was appointed foreman of the air brake and boiler appurtenances department in 1909. In 1911 he was appointed assistant mechanical engineer of the Leslie Company, Lyndhurst, N. J., and, in 1913, joined the Norfolk & Western and served in various capacities until 1918, when he joined Nathan Manufacturing.

John D. Spaulding

Mr. Spaulding received his early training with the Chicago & North Western. After obtaining his mechanical engineering degree from Iowa State College, in 1924, he joined the Collis Company, Clinton, Iowa, where he advanced to superintendent. In 1932 he was appointed works manager of Nathan Manufacturing.

The General Electric Company has announced the election of **Edwin E. Potter** as vice-president in charge of the commercial aspects of the company's relations with customers, to succeed **Earl O. Shreve,** who has been appointed to the president's staff, assigned to special duties.

A. D. Robertson, formerly assistant manager of sales and engineering of the Electrical section at the Norwood, Ohio, works of the **Allis-Chalmers Manufacturing Company,** has been appointed manager of the company's district office at Tampa, Fla., succeeding the late **Berrien Moore.**

The **Air Reduction Company** has announced the appointment of **Herman Van Fleet, Jr.,** former assistant to the manager of the New York district, as manager of its New England district, with headquarters in Boston, Mass. He will cover Maine, Vermont, New Hampshire, Massachusetts, Rhode Island and the eastern third of Connecticut. Mr. Van Fleet also will be in charge of the company's plants at Boston, South Portland, Me., and Central Falls, R. I. The appointments also were annuonced of **Emmett W. MacCorkle, Jr.,** former assistant manager of the gas sales department at New York, as Portland (Ore.) district manager, covering Oregon, the southern half of Idaho and part of Washington in the vicinity of Walla Walla, and **L. A. Hamilton,** former assistant manager of the Seattle, Wash., district as manager of that district, which embraces most of Washington, northern Idaho and Montana.

R. G. LeTourneau Inc., Peoria, Ill., has announced the following staff appointments and changes: **Robert C. Lewis** as installation manager of the company. A 1932 graduate of the University of Cincinnati in civil engineering, Mr. Lewis has served ten years with Cincinnati, Ohio, highway department and five years with the U. S. Army Engineers. His department is concerned with field engineering work, the supervision of plant engineering projects, and distributor personnel sales training programs. **Keith Thompson** as applications engineer. Mr. Thompson has been a LeTourneau service engineer for the past seven years. His special duties will include the coordination of field engineering with equipment service functions, recommendations for the effective use of equipment, and assistance in training programs in the mechanics of equipment operation. **O. A. Williams** as western sales manager, with headquarters at Stockton, Cal. Formerly a LeTourneau district representative and more recently eastern sales manager, Mr. Williams now supervises the activities of LeTourneau sales and service representatives in seven western states, and assists distributors. **E. M. Ferguson** as eastern sales manager, with headquarters at 1026 17th street, N. W., Washington, D. C. With LeTourneau for more than eight years as district representative, assistant western sales manager, and, recently, as western sales manager, Mr. Ferguson coordinates the activities of LeTourneau sales, service representatives, and distributors in twenty-three eastern states. **C. D. Fey,** formerly western industrial sales representative, as industrial sales representative for the entire country, with headquarters at Peoria, where he will assist distributors who specialize in the sale of equipment to

railroads and heavy industries. The company's central sales office has been moved from Peoria to suite 616, City Bank Building, Kansas City, Mo., where **W. B. Worden,** central sales manager, supervises sales and service activities in eighteen midwestern states.

OBITUARY

Phillip Tarasi, a member of the railroad sales department of the Chicago Pneumatic Tool Company, died on March 4, after a short illness. He was 57 years old.

George A. Hull, vice-president and a director of the Union Asbestos & Rubber Company, died at his home in Vista, Cal., on April 5, following a short illness.

Car Service

I. C. C. Service Order No. 697-B, effective from 12:01 a.m. April 5, vacated Service Order No. 697 which had provided car-supply priorities for the government's export shipments of Red River Valley potatoes.

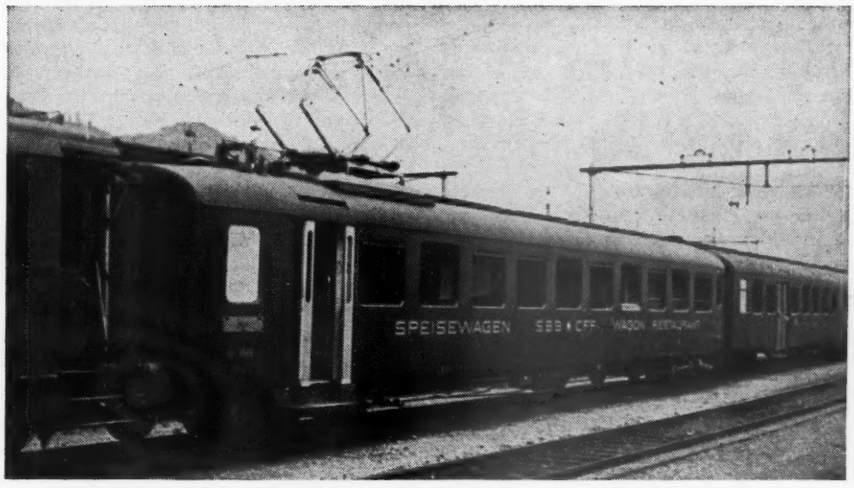
The Office of Defense Transportation has issued Amendment No. 6 to its minimum-loading order for carload freight—General Order ODT-18A-Revised. The amendment, effective from April 11, exempts from the provisions of the order carload freight (including import, coastwise and intercoastal freight) moving first by water on the high seas to a port in continental United States or moving first by water on the high seas to a port in continental United States and then by inland water carrier to another point in continental United States, provided such carload freight is a complete order and so identified from the point it is first shipped by water and is contained in a single car.

Overseas

BRAZIL.—A specially equipped three-car train has been put in service by Brazil's Rede Mineira de Viacao for rendering medical and dental aid to its staff along the line. Accommodation for the train staff is provided in the first coach, which holds also the fuel necessary for an electric generating set. The second coach houses the medical staff of doctors, dentists and nurses in two six-berth compartments, and also provides two consulting compartments. In the third coach is installed modern X-ray equipment, a dark room and examination room. It is planned to give medical and dental care to all of the road's staff and their families.

GREAT BRITAIN.—More than 25,000 members of the British traveling public had a hand in designing the new Southern Railway cars, three of which have just been put into service on the "Atlantic Coast Express." Special features of 72 cars now under production were adapted from the suggestions of visitors who inspected a prototoype car exhibited by the company last year. Because the majority of visitors expressed a preference for compartment rather than open-type cars, 80 seats are provided in compartments as against 64 in the open part of the new vehicles. Individual lamps supplementing general overhead lighting, individually controlled heating in first class compartments, heating of lavatories and corridors are among the other suggestions of the public put into effect. An extra three inches of seating space has been created by curving the sides of the new cars.

Half the new cars are expected to be completed in time for the coming summer's traffic, providing an increased seating capacity of more than 1,600.



New dining cars on the Swiss Federal Railways take current from live wires for ovens and lighting—not for propulsion

* * *

INDIA. — The government of India is reported to be studying a scheme for the electrification of 1,500 miles of railways—part of a long-term post-war development plan. It covers the Bombay-Ahmedabad section, the Howrah-Moghal Sarai section via the Grand Chord, and suburban services near and around Calcutta. The proposed electrification, it is estimated, would effect an annual saving of around 600,000 tons of coal.

NEW SOUTH WALES. — The severest drought in many years was experienced in New South Wales during the summer of 1946. The north and northwest sections were particularly hard hit, and the railways of that Australian state were required to do a mammoth job of transporting starvation-threatened cattle to southern parts of the state less seriously affected. In July 10,000 head of cattle and 150,000 sheep were transported by rail under "starving stock conditions," whereby a reduction of 25 per cent of the freight charge on the forward journey and the livestock's return to its original pasture at a later date without any freight charges are allowed. During August some 75,000 cattle and 1,000,000 sheep, 15,000 cattle and 250,000 sheep falling under the starving stock terms, were shipped to the south where feed was available.

Organizations

R. H. Klank, business manager of the North Western "Newsliner," employee publication of the Chicago & North Western, has been elected treasurer of the **American Railway Magazine Editors Association.**

The **Transportation Club of the Rochester Chamber of Commerce** will hold a "Perfect Shipping Meeting" at noon, on April 23, in the Chamber of Commerce, with Arthur J. Dailor, traffic manager of the W. N. Clark Company, presiding. This meeting is being held in cooperation with the **Atlantic States Shippers Advisory Board.** It will be based on the theme "Let's Brush Up on Perfect Shipping" and will feature a talk by Frank G. Love, manager, property protection and safety of the New York Central.

The **New England Shippers Advisory Board** will hold its eighth annual "Perfect Shipping Month" dinner on April 24, at the Hotel Falmouth in Portland, Me. The principal speaker at the meeting will be Laurence F. Whittemore, president of the Federal Reserve Bank of Boston, who will talk on "The Future—A Challenge to Railroad Management." Other speakers will include William H. Day, general chairman of the New England Shippers Advisory Board; A. P. Little, traffic manager of the Dennison Company; and Martin J. Manning, traffic manager of the Hollingsworth & Whitney Paper Co.

The **Passenger, Ticket & Freight Agents' Association of Texas,** meeting in Galveston, Tex., on March 29 and 30, disclosed plans to "streamline" Texas railroad personnel in courtesy, friendliness and efficiency to "match the carriers' 'streamlining' of freight and passenger equipment." Two district directors and two traffic counselors, freight and passenger, will be appointed at all principal railroad centers in the state, to cooperate with local traffic clubs and other trans-

portation agencies in carrying out the association's plans.

Officers elected at the meeting were: President, Charles Sorg, Jr., Northern Pacific, Dallas, Tex.; first vice-president, J. V. Cooley, New York Central, Houston, Tex.; second vice-president, John Y. Cassell, Akron, Canton & Youngstown, Dallas; secretary-treasurer, J. G. Hatcher, Chicago, Milwaukee, St. Paul & Pacific, Dallas; chairman of executive committee, Elza Curtis, Chesapeake & Ohio and Pere Marquette, Dallas; executive committee members, E. P. Walker, Houston Belt & Terminal, Houston, and W. M. Vaughn, Southern Steamship Company, Dallas.

Financial

ALEXANDER. — *Stock.* — This company, which was organized to take over an 18.5-mile line between Statesville, N. C., and Taylorsville after it had been abandoned by the Southern, has applied to the Interstate Commerce Commission for authority to issue $100,000 in stock with a par value of $1 per share. Proceeds of the issue would repay a $50,350 advance with which the line was acquired, finance the acquisition of equipment and facilities and provide funds for organization expenses, working capital and manitenance work.

ATLANTIC & EAST CAROLINA.—*Notes.*—Division 4 of the Interstate Commerce Commission has authorized this road to issue at par $363,939 in secured promissory notes. One note of $323,939 will be applied toward the payment of the $254,189 balance due on a secured promissory note and the purchase price of a 600-hp. Diesel-electric switching locomotive, at an estimated cost of $69,750, from the Electro-Motive Division of the General Motors Corporation. The note, will be payable to the Wachovia Bank & Trust Co., Winston-Salem, N. C., in 112 monthly installments and a final installment sufficient to extinguish the indebtedness then remaining. The note will bear interest at the rate of 2¾ per cent yearly.

Proceeds of the second note of $40,000, will be applied toward the purchase of 22,000 ties for which the First-Citizens Bank & Trust Co. of Smithfield, N. C., has agreed to loan the applicant $40,000 at the rate of $8,000 a month. This note will bear interest at the rate of 4 per cent yearly.

BEAVER, MEADE & ENGLEWOOD.—*New Directors.*—Stockholders of this road, a subsidiary of the Missouri-Kansas-Texas, voted at their annual meeting on April 3 to enlarge the membership of the board of directors from 9 to 13. The following then were elected directors: P. B. Garrett, president, Texas Bank & Trust Co., Dallas, Texas; W. W. Overton, chairman, Texas Bank & Trust Co.; T. B. Cochran, oil operator, Dallas; and Otto F. Bryan of J. S. Bryan & Sons, Tulsa, Okla.

GALVESTON, HOUSTON & HENDERSON.—*Notes.*—Division 4 of the Interstate Commerce Commission has authorized this road to issue at par not exceeding $1,672,000 of guaranteed serial collateral notes, the proceeds of which will be applied toward the retirement of a like indebtedness to the Reconstruction Finance Corporation. As collateral security the applicant has been authorized to issue and pledge $2,801,500 of 4 per cent Series B first mortgage bonds, now pledged with the R. F. C. At the same time, the commission authorized the Missouri-Kansas-Texas, and the International-Great Northern to assume liability for the notes. The R. F. C. has been receiving 4 per cent interest on the loan, and the applicant has accepted bids of three Houston, Tex., banks which have agreed to pay par for the notes with a 3 per cent interest rate. The new series, to be dated as of the date of issue, will consist of 20 notes in principal amounts varying from $72,314 to $95,792, with one note maturing every six months over a 10-year period from the date of issue. Subject to the usual employee-protection conditions, the commission also authorized the modification of agreements, under which the I.-G. N. and the M. K. T. of Texas operate over the G. H. & H., to conform with the new financing program.

INTERSTATE.—*Equipment Trust Certificates.*—Division 4 of the Interstate Commerce Commission has authorized this road to assume liability for $2,700,000 of series G. equipment trust certificates, the proceeds of which will be applied toward the payment of notes, the purchase price of new equipment, the cost of constructing a $225,000 spur to its so-called Pine branch, and other expenditures, as outlined in *Railway Age*, March 15, page 576. The certificates will mature in 15 equal annual installments, starting April 15, 1948. The report also approves a selling price of 99.3544 with a 2⅛ per cent interest rate, the bid of Harriman, Ripley & Co., on which basis the average annual cost will be approximately 2.22 per cent.

MISSOURI-KANSAS-TEXAS.—*Annual Report.*—Operating revenues of this road last year totaled $60,732,982, compared with $83,093,893 in 1945, according to the annual report. Operating expenses were $48,601,622, compared with $57,134,076. Fixed charges were $2,199,547, compared with $2,427,991. Net income was $1,715,446, compared with $5,867,598. Current assets at the end of the year were $18,925,914, compared with $31,255,979. Current liabilities were $14,044,277, compared with $26,064,800. Long term debt was $68,683,018, compared with $70,312,519.

"A vigorous debt reduction program begun in 1942 has reduced fixed interest debt by $43,316,265 and the interest on that debt by $2,154,828, or almost 50 per cent," R. J. Morfa, chairman, and Donald V. Fraser, president, said in the report. "In 1946, through the efforts of the industrial research and development department, 240 new industries were aided in finding locations along Katy rails," they added. "These industries involved an investment of approximately $14,600,000. They will employ 4,500 workers, and it is estimated that they will produce 35,750 carloads of traffic per year."

NEW YORK, NEW HAVEN & HARTFORD.—*Equipment Trust Certificates.*—This road has applied to the Interstate Commerce Commission for authority to assume liability for $5,265,000 of equipment trust certificates, the proceeds of which would be applied toward the purchase of 15 4,500-hp. Diesel-electric freight locomotives from the American Locomotive Company. Each of the locomotives will consist of 3 1,500-hp. units, 30 of which are estimated to cost $139,750 each, and the remaining 15 $127,650 each. The certificates would be dated May 1 and sold on the basis of competitive bidding.

PERE MARQUETTE.—*Promissory Notes.*—Division 4 of the Interstate Commerce Commission has authorized this road to issue $628,000 in promissory notes to further evidence the indebtedness it plans to assume under a conditional sales agreement with the Electro-Motive Division of the General Motors Corporation, as reported in *Railway Age* of March 29, page 676. The notes, to be dated April 1, will be payable quarterly, starting July 1, through April 1, 1957. They have been awarded to the National City Bank of New York, whose bid of par with a 1¾ per cent interest rate had been accepted subject to commission approval.

ST. LOUIS & TROY.—*Promissory Note.*—This road has applied to the Interstate Commerce Commission for authority to issue a $10,000 promissory note to evidence a loan of the same amount from M. C. Foster, of Troy, Mo. Proceeds will be applied toward the purchase of a locomotive. The note would bear interest at the rate of 5 per cent yearly and would be payable in 10 annual installments.

SEABOARD AIR LINE.—*Securities.*—Division 4 of the Interstate Commerce Commission has modified its supplemental order of June 28, 1946, in the Finance Docket No. 14500 proceeding, so as to extend from April 1 to January 1, 1948, the time within which this road may sell securities issued pursuant to its reorganization plan. The sale would provide cash for settlements with holders of old Seaboard securities which are not deposited for exchange under the plan of reorganization. The applicant told the commission that certain securities of the old Seaboard are held in Holland and other foreign countries, thereby delaying the deposit under the plan and that the distributable share in respect to the non-deposited bonds cannot presently be ascertained.

SOUTHERN.—*Annual Report.*—Operating revenues of this road last year totaled $212,041,109, compared with $247,536,833 in 1945. Operating expenses were $171,791,729, compared with $173,945,280. Fixed charges were $12,651,070, compared with $13,674,238. Net income was $9,252,269, compared with $16,298,720. Current assets at the end of the year were $90,971,989, compared with $123,560,325. Current liabilities were $46,614,461, compared with $74,806,710. Long term debt was $233,748,882, compared with $221,358,258.

TEXAS CENTRAL.—*New Directors.*—G. M. Walter, manager at Waco, Tex. for the Owens-Illinois Glass Company, and Henry C. Beck, Jr., of H. C. Beck Construction

NORFOLK AND WESTERN RAILWAY COMPANY

Summary of Fifty-first Annual Report for 1946

Railway Operating Revenues decreased $15,149,000, or 10.46 per cent., under 1945, due principally to decline in war traffic and railroad and bituminous coal strikes. Railway Operating Expenses decreased $6,590,000, or 6.66 per cent. Balance of Income, after deducting Sinking and Reserve Funds Appropriations, increased $54,000. After deducting dividends on Adjustment Preferred Stock, the balance remaining, $21,854,000, was equivalent to $15.54 per share of Common Stock held by the public.

Condensed Income Statement

	1946	Comparison with 1945		Per Cent.
Railway Operating Revenues	$129,714,096.03	Dec.	$15,149,422.73	10.46
Railway Operating Expenses	92,333,968.61	Dec.	6,590,484.71	6.66
Net Revenue from Railway Operations	$37,380,127.42	Dec.	$8,558,938.02	18.63
Railway Tax Accruals: Federal $19,335,940.90 State, County and Local 5,730,062.86	25,066,003.76	Dec.	7,571,860.89	23.20
Railway Operating Income	$12,314,123.66	Dec.	$987,077.13	7.42
Rent Income — Equipment and Joint Facilities — Net	9,638,553.84	Inc.	172,337.25	1.82
Net Railway Operating Income	$21,952,677.50	Dec.	$814,739.88	3.58
Non-Operating Income	3,894,030.93	Inc.	904,519.97	30.26
Total Income	$25,846,708.43	Inc.	$89,780.09	.35
Deductions from Total Income: Interest on Funded Debt	$2,071,945.46	Dec.	$34,062.80	1.62
Other Deductions	47,087.19	Dec.	70,153.04	59.84
	$2,119,032.65	Dec.	$104,215.84	4.69
Net Income	$23,727,675.78	Inc.	$193,995.93	.82
Sinking and Reserve Funds —Appropriations	994,266.46	Inc.	139,509.96	16.32
Balance of Income	$22,733,409.32	Inc.	$54,485.97	.24
Dividends on Adjustment Preferred Stock—$4.00 per share	879,608.00	Inc.	216.00	.02
Balance Transferred to Earned Surplus	$21,853,801.32	Inc.	$54,269.97	.25

Condensed Earned Surplus—Unappropriated

Credit Balance, January 1, 1946		$203,853,718.78
Credits:		
Balance Transferred from Income	$21,853,801.32	
Miscellaneous Credits	284,771.50	
Total Credits		22,138,572.82
		$225,992,291.60
Charges:		
Appropriation of Surplus for Dividends on Common Stock—$13.00 per share	$18,284,279.00	
Miscellaneous Charges	2,871,246.82	
Total Charges		21,155,525.82
Credit Balance, December 31, 1946		$204,836,765.78

Dividends

Dividends were paid upon the outstanding Adjustment Preferred Stock at the annual rate of $4.00 per share, or $880,000. Dividends were paid upon the outstanding Common Stock in 1946 at the annual rate of $10.00 per share, and an extra dividend of $3.00 per share was paid March 10, 1947, out of 1946 earnings transferred to surplus, making a total distribution of $13.00 per share, or $18,284,000, the same as for 1945.

Taxes

Railway Tax Accruals were $25,066,000, a decrease of $7,572,000, or 23.20 per cent. Taxes amounted to $1,156 for each employee, to $18 for each share of Common Stock, to 19 cents per dollar of Operating Revenues and to 4 per cent. of Railway Property Investment. Federal taxes, $19,336,000, representing 77.14 per cent. of all tax accruals for the year, decreased $7,588,000, or 28.18 per cent. Included in this amount were accruals for Normal tax and Surtax, $15,500,000, and Railroad Retirement and Unemployment Insurance taxes, $3,808,000. The decrease in Federal taxes was due principally to reduced revenues and to repeal of Excess Profits and Capital Stock taxes.

Transportation Rates

The railroads of the country petitioned the Interstate Commerce Commission on April 15, 1946, for an increase of 25 per cent. in freight rates and retention of the 10 per cent. increase in basic passenger fares in effect since February 10, 1942. Temporary increases in freight rates of approximately 6 per cent., with a further increase of 5 per cent. in the Eastern territory effective July 1, 1946, added approximately $2,940,000 to this Company's revenues during the last six months of the year. Effective January 1, 1947, the temporary rates were replaced with increases approximating 17.9 per cent. for the Eastern territory and 17.4 per cent. for the remainder of the country. The increase in rates on coal, this Company's principal commodity, averaged 9.7 per cent. The 10 per cent. increase in passenger fares was permitted to continue in effect without time limitation. It is estimated that the gross revenues to the Company under the new rates on the volume and character of traffic handled in 1946 would be $10,900,000 greater than the revenue actually received in 1946.

Additional revenues from rate increases in recent years have fallen far short of meeting increased operating costs. Based on the Company's 1946 volume of business, it is estimated that freight and passenger rate increases since January, 1939, will yield $15,000,000, or 12 per cent., additional revenues per year. During the same period, wage rates, payroll taxes, cost of materials, supplies and fuel have increased 50 per cent., or $32,550,000 annually.

Reserve Fund for Taxes and Contingencies

The Reserve Fund for Taxes and Contingencies aggregated $39,960,000 at the end of 1946. Of this fund, $32,960,000 was invested in United States Government obligations.

Financial

The Capital Stock of the Company held by the public was $162,638,500, and represented 76.56 per cent. of outstanding stock and bond capitalization. On December 31, 1946, the Company's stockholders numbered 13,996.

The Total Funded Debt was $49,783,131.92, and represented 23.44 per cent. of outstanding capitalization. Fixed charges were earned 12.44 times in 1946 and an average of 13.46 times over the last ten years.

At the end of the year appropriations to the voluntary sinking fund for retirement of direct Funded Debt and income from investments totaled $3,730,000, and investments in securities had a market value of $3,789,000.

Wage Increases

In 1945 the demands of railroad employees for wage increases and revision of working rules were submitted to the railroads. Through awards in 1946 by arbitration boards and a Presidential fact-finding board, employees received an increase of 16 cents per hour retroactive to January 1, 1946, and an additional 2½ cents per hour beginning May 22, 1946, in consideration of withdrawal of all rule change demands for one year. These wage increases amounted to $10,332,000 per year for the Company on the basis of 1946 employment.

The Crosser Act

The Crosser Act, passed by Congress in 1946 at the request of railway labor organizations, changed substantially the benefits

for railroad employees under the Railroad Retirement Act, added benefits for sickness and accident whether or not attributable to railroad employment to be paid for out of the Railroad Unemployment Insurance Fund and increased the rate of tax to be paid by both the employers and the employees. On the first $300 of monthly wages for each employee railroad companies now pay for retirement 5¾ per cent. and for unemployment 3 per cent., or a total of 8¾ per cent.; employees pay 5¾ per cent. for retirement only, a total of 14½ per cent. for both. Other industries pay 1 per cent. for retirement and about 1½ per cent. for unemployment, both based upon the first $250 of monthly wages; employees of such other industries pay 1 per cent. for retirement, a total of 3½ per cent. for both. In 1946 this Company paid $3,808,000 for retirement and unemployment. Assuming the same payroll for 1947, the Company will pay $5,126,000, equivalent to $3.64 per share of Common Stock. A company subject to the Social Security Act with comparable payroll would pay an estimated $1,400,000 in each of these two years. There appears to be no justifiable reason for separate social legislation for railroad employees.

Employees

The average number of employees during the year was 21,678. Railway Property Investment of $579,800,000 averaged $26,746 per employee. The Company's total payroll for 1946 was $62,380,000, an average of $2,878 per employee, compared with $54,734,000 and $2,492 respectively, for 1945. In addition to wages and salaries, the Company paid $4,441,000, an average of $205 per employee, for Railroad Retirement and Unemployment Insurances taxes and employee Relief and Pension Funds.

The Board expresses to the officers and employees its appreciation of the continued fidelity, diligence and efficiency with which they have served the Company and the public during the year.

R. H. SMITH, *President.*

[Advertisement]

Company, Dallas, have been elected directors of this road, a subsidiary of the Missouri-Kansas-Texas. The stockholders previously had authorized an increase in the board membership from 7 to 9. In answer to a question about the increase in the size of the directorate, R. J. Morfa, chairman, said "it is simply a matter of enlarging the board to admit the election of civic leaders from a greater number of communities served by the company. We expect soon to ask the stockholders of the parent company to increase the board membership of the M.K.T. from 15 to 18. When this is done we will invite additional Southwestern business men to serve on the parent board."

Average Prices Stocks and Bonds

	Apr. 8	Last week	Last year
Average prices of 20 representative railway stocks..	47.05	48.72	63.66
Average prices of 20 representative railway bonds..	90.56	91.25	112.89

Dividends Declared

Atchison, Topeka & Santa Fe.—$1.50, quarterly, payable June 2 to holders of record May 6.

Atlantic Coast Line.—5% non-cum. preferred, $2.50, semi-annually, payable May 10 to holders of record April 23.

Carolina, Clinchfield & Ohio.—$1.25, quarterly, payable April 21 to holders of record April 10.

Louisville & Nashville.—88¢, quarterly, payable June 12 to holders of record May 1.

Morris & Essex Extension.—$2.00, semi-annually, payable May 1 to holders of record April 16.

Philadelphia & Trenton.—$2.50, quarterly, payable April 10 to holders of record April 1.

Piedmont & Northern.—50¢, quarterly, payable April 21 to holders of record April 5.

Waterloo, Cedar Falls & Northern.—50¢, payable April 7 to holders of record March 26.

Abandonments

GREAT WESTERN.—This road has applied to the Interstate Commerce Commission for authority to abandon and dismantle a portion of its line extending 23 miles from a point near Milliken, Colo., to Wattenberg.

READING.—This road has applied to the Interstate Commerce Commission for authority to abandon a portion of a branch from Kimberton, Pa., to Byers, approximately 6.7 miles.

SUNCOOK VALLEY.—Division 4 of the Interstate Commerce Commission has authorized this road to abandon a 4.6-mile branch from Pittsfield, N. H., to Center Barnstead.

Railway Officers

EXECUTIVE

W. W. Judson, whose appointment as vice-president of maintenance and operation of the Northern Pacific, with headquarters at St. Paul, Minn., was reported in the *Railway Age* of April 5, was born at Rochelle, Ill., on March 24, 1891, and received

W. W. Judson

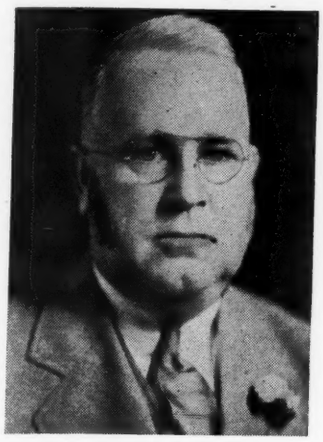
his higher education at Knox College and at Dartmouth College. He entered railroad service in 1912 in the engineering department of the Spokane, Portland & Seattle, at Portland, Ore. On October 11, 1914, he entered the service of the Northern Pacific as a rodman in the engineering department at Centralia, Wash. Released from the armed forces as a first lieutenant, he returned to the Northern Pacific in 1919 as an assistant engineer of maintenance and construction. In 1928 he entered the operating department as a special assistant to the vice-president, at St. Paul, and one year later he was appointed trainmaster at Pasco, Wash. From 1933 to 1936 he served as assistant to the general manager, at Seattle, Wash. In 1936 Mr. Judson was appointed superintendent, and served successively on the Yellowstone and Rocky Mountain divisions. On February 1, 1940, he was advanced to general manager, with headquarters at St. Paul, the position he held at the time of his recent appointment.

James M. Symes, whose appointment as vice-president in charge of operation of the Pennsylvania, with headquarters at Philadelphia, Pa., was reported in the *Railway Age* of April 5, was born at Glen Osborne, Pa., on July 8, 1895. He entered railroad service in 1916 as clerk in the trainmaster's office of the Pennsylvania at Pittsburgh, Pa., transferring to the general superintendent's office at Cleveland, Ohio, in 1920. Mr. Symes was appointed freight movement director in the office of the superintendent of freight transportation at Pittsburgh in 1923 and in 1927 he became chief clerk to general manager. One year later he was appointed superintendent passenger transportation of the Western region at Chicago and in 1929 he was transferred to the Eastern region at Philadelphia. In 1934 he became chief of freight transportation of the Pennsylvania and a year later he was appointed vice-president, operations and maintenance departments of the Association of American Railroads. From 1939 to 1941 Mr. Symes was general manager of the Western region of the Pennsylvania and in 1942 he became vice-president of the Western region at Chicago. He was appointed deputy vice-president in charge of operation at Philadelphia in October, 1946.

James M. Symes

John Francis Deasy, whose appointment as vice-president—assistant to presi-

dent of the Pennsylvania at Philadelphia, Pa., was reported in the *Railway Age* of April 5, was born at Hammorton, Pa., on March 25, 1882, and entered railroad serv-



John Francis Deasy

ice on June 10, 1901, as a telegraph operator on the then Central division of the Pennsylvania. While serving as a station agent on the Trenton division, he attended night school and studied law, and in 1912, was appointed supervising agent of the division. Successive advances in the operating department brought Mr. Deasy to the position of chief of freight transportation for the entire railroad in 1927. He became vice-president of the Central region at Pittsburgh, Pa., in 1931, and two years later returned to Philadelphia as vice-president in charge of operation, the position he held until his recent appointment as vice-president—assistant to president.

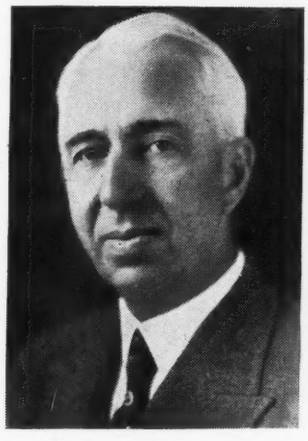
Nye F. Morehouse, general solicitor of the Chicago & North Western, has been elected vice-president and general counsel, with headquarters as before at Chicago, succeeding **William T. Faricy,** who has been elected president of the Association of American Railroads.

James W. McLaughlin, whose promotion to assistant vice-president in charge of car department of the Southern Pacific

James W. McLaughlin

of Mexico, at Guadalajara, Jalisco, was reported in the *Railway Age* of April 5, was born on April 10, 1917, at Alamosa, Colo. He entered railway service with the Denver & Rio Grande Western in 1936 as a car builder apprentice, and later held positions as mechanic and car foreman with that road, and as car builder technician with the U. S. Railway Mission in Mexico. In 1945 he returned to the D. & R. G. W. as general car foreman, the position from which he resigned to accept his new appointment with the S. P. of Mexico.

H. E. Stevens, whose retirement as vice-president of maintenance and operation of the Northern Pacific, with headquarters at St. Paul, Minn., was reported in the *Railway Age* of April 5, was born at Bluehill, Me., on March 8, 1874, and was graduated by the University of Maine in 1897 with the degree of C.E. Shortly thereafter he entered the employ of Ralph Modjeski, construction engineer, at Chicago, who at that time was designing all bridge work for the Northern Pacific. Early in 1904 Mr. Stevens began his long service with the Northern Pacific in the engineering department and for the next three years he was in charge in the field of the construction of several large bridges and viaducts. He returned to St. Paul in February, 1907, organized a bridge depart-



H. E. Stevens

ment for the road, and served as system bridge engineer until 1916, when he was promoted to chief engineer. In 1928 he was advanced to vice-president of maintenance and operation, the position he held at the time of his retirement.

FINANCIAL, LEGAL AND ACCOUNTING

Lowell Hastings, assistant general counsel of the Chicago & North Western, at Chicago, has been promoted to general solicitor there, succeeding **Nye F. Morehouse,** whose election as vice-president and general counsel, is reported elsewhere in this issue. Mr. Hastings is succeeded by **Warren Newcome,** assistant general solicitor.

TRAFFIC

Hardie B. Hewitt has been appointed general agent of the Illinois Central, with headquarters at Birmingham, Ala.

Hiram T. Askew, assistant to general passenger agent of the Chesapeake & Ohio, has been promoted to assistant general passenger agent, with headquarters as before at Richmond, Va.

William A. Nelson, Jr., general agent of the Illinois Terminal, at Chicago, has been transferred to New Orleans, La., succeeding **H. J. Devereux,** whose death is reported elsewhere in this issue. Mr. Nelson is succeeded by **John G. Lafleur.**

John P. McElree has been appointed assistant to freight traffic manager of the Gulf, Colorado & Santa Fe (part of the Atchison, Topeka & Santa Fe), at Galveston, Tex., succeeding **Harvey R. Wright,** whose appointment as assistant general freight agent of the Santa Fe at San Francisco, Cal., was reported in the *Railway Age* of April 5.

C. F. Messenkopf, traffic manager of the Railway Express Agency, has been appointed general traffic manager, with headquarters at New York, succeeding **R. S. Wheeler,** who will assume new duties as special assistant to the vice-president in charge of traffic. **C. B. Williams,** assistant to vice-president, has been appointed traffic manager, succeeding Mr. Messenkopf. **O. G. Swenson,** assistant traffic manager, has been appointed assistant to vice-president, succeeding Mr. Williams. **J. R. Rohrer,** general agent at Denver, Colo., has been appointed assistant traffic manager, succeeding Mr. Swenson.

OPERATING

Robert E. Mattson, whose promotion to general superintendent of transportation of the Northern Pacific, at St. Paul, Minn., was reported in the *Railway Age* of April 5, was born on March 24, 1901, at Minneapolis, Minn., and is a graduate of the U. S. Naval Academy and the Massachusetts Institute of Technology. He entered railway service with the N. P. in 1926 as a track apprentice on the Lake Superior division, and served later in various operating capacities on several divisions

Robert E. Mattson

and as superintendent of the Northern Pacific Transport Company (a subsidiary of the road). He became assistant division superintendent at Spokane, Wash., in 1941. The following year he entered military service, with subsequent duty in Iran, the

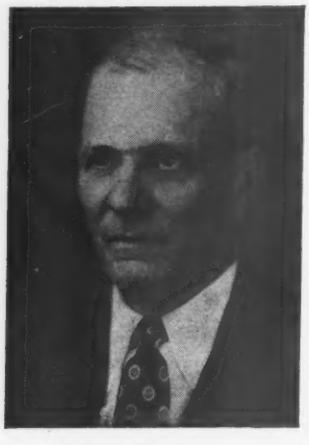
Philippines and Japan. He attained the rank of colonel prior to his return to the N. P. in December, 1945, at which time he was appointed assistant general superintendent of transportation. Mr. Mattson held the latter position at the time of his new appointment.

F. H. Berry, assistant superintendent of terminals of the Louisville & Nashville and Nashville, Chattanooga & St. Louis, with headquarters at Nashville, Tenn., has been promoted to superintendent of terminals, with the same headquarters. He succeeds **J. P. Polk**, who has retired.

George C. Stuart, whose promotion to superintendent of the Chicago & North Western, at Chadron, Neb., was reported in the *Railway Age* of March 15, was born on July 31, 1902, at Milwaukee, Wis. He entered railway service with the C. & N. W. in 1919 as a clerk at Chicago, and later held positions as switchtender, freight brakeman, yardmaster and freight conductor. In 1936 he was advanced to trainmaster at Sterling, Ill., a position he also held later at South Pekin, Ill., and Chicago. For a time he was assistant trainmaster at Kenosha, Wis. Mr. Stuart was promoted to assistant superintendent at North Fond du Lac, Wis., in 1942, and from September 1, 1944, to February 1, 1946, he was in military service, serving as a lieutenant colonel with the 703rd Railway Grand Division and with the military government in Germany. He returned to the road following his release from the Army, and was subsequently appointed assistant superintendent at Adams, Wis. He held the latter position at the time of his new appointment.

ENGINEERING & SIGNALING

Robert L. Groover, whose appointment as chief engineer of the Atlantic Coast Line at Wilmington, N. C., was reported in the *Railway Age* of April 5, was born at Quitman, Ga., on November 7, 1891, and received his B. S. in civil engineering



Robert L. Groover

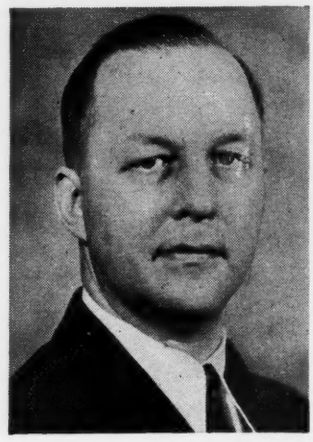
from Alabama Polytechnic Institute in 1914. He entered railroad service in September, 1914, with the Atlantic Coast Line as inspector, subsequently serving as rodman and draftsman, maintenance of way, until March 1, 1916, when he went with the Central of Georgia as draftsman. In November, 1916, Mr. Groover returned to the Atlantic Coast Line and served successively as draftsman, computer and pilot engineer in the valuation department. He was appointed assistant engineer maintenance of way in November, 1918, and in May, 1920, he became assistant engineer in the office of the chief engineer. From December, 1924, to 1929, Mr. Groover served as office engineer, becoming engineer of design in the latter year. He was appointed principal assistant engineer in December, 1941, being promoted to assistant chief engineer in November, 1944, which position he held until his recent promotion.

Charles Spurgeon Sanderson, whose appointment as assistant chief engineer of the Atlantic Coast Line at Wilmington, N. C., was reported in the *Railway Age* of April 5, was born at Houlka, Miss., on October 8, 1901, and received his B. S. in civil engineering from Mississippi State College in 1923. Entering railroad service on June 1, 1923, as rodman in the construction department of the Atlantic Coast Line,

Charles Spurgeon Sanderson

he became instrumentman in June, 1924, resident engineer in February, 1925, and division engineer in the maintenance of way department in February, 1930. Mr. Sanderson went with the Charleston & Western Carolina in January, 1933, as roadmaster, becoming assistant superintendent in January, 1939. From July, 1942, to September, 1945, as a lieutenant colonel, he was staff officer in charge of railway reconstruction and maintenance, Military Railway Service, 703rd Railway Grand Division, serving 34 months overseas in Africa, Italy France, and Germany. He received the Legion of Merit and the French Croix de Guerre, and was discharged as colonel. Mr. Sanderson returned to the Atlantic Coast Line in October, 1945, as principal ssistant engineer, the position he held at the time of his recent promotion to assistant chief engineer.

John E. South, whose appointment as engineer of bridges and buildings of the Pennsylvania at Philadelphia, Pa., was reported in the *Railway Age* of February 1, was born on June 27, 1900, at Allegheny, Pa. Mr. South was graduated from the University of Pittsburgh in 1924, with the degree of bachelor of science in civil engineering, and entered railroad service in July, 1924, in the office of the engineer of bridges and buildings of the Pennsylvania at Pittsburgh, Pa. Except for a period from 1927 to 1933, when he was employed on the design of structures for the Philadelphia improvements, Mr. South has been in the



John E. South

office of the engineer of bridges and buildings at Philadelphia since 1925, serving successively as supervising draftsman, office engineer and assistant engineer of bridges. He held the latter position at the time of his promotion to engineer of bridges and buildings, effective February 1.

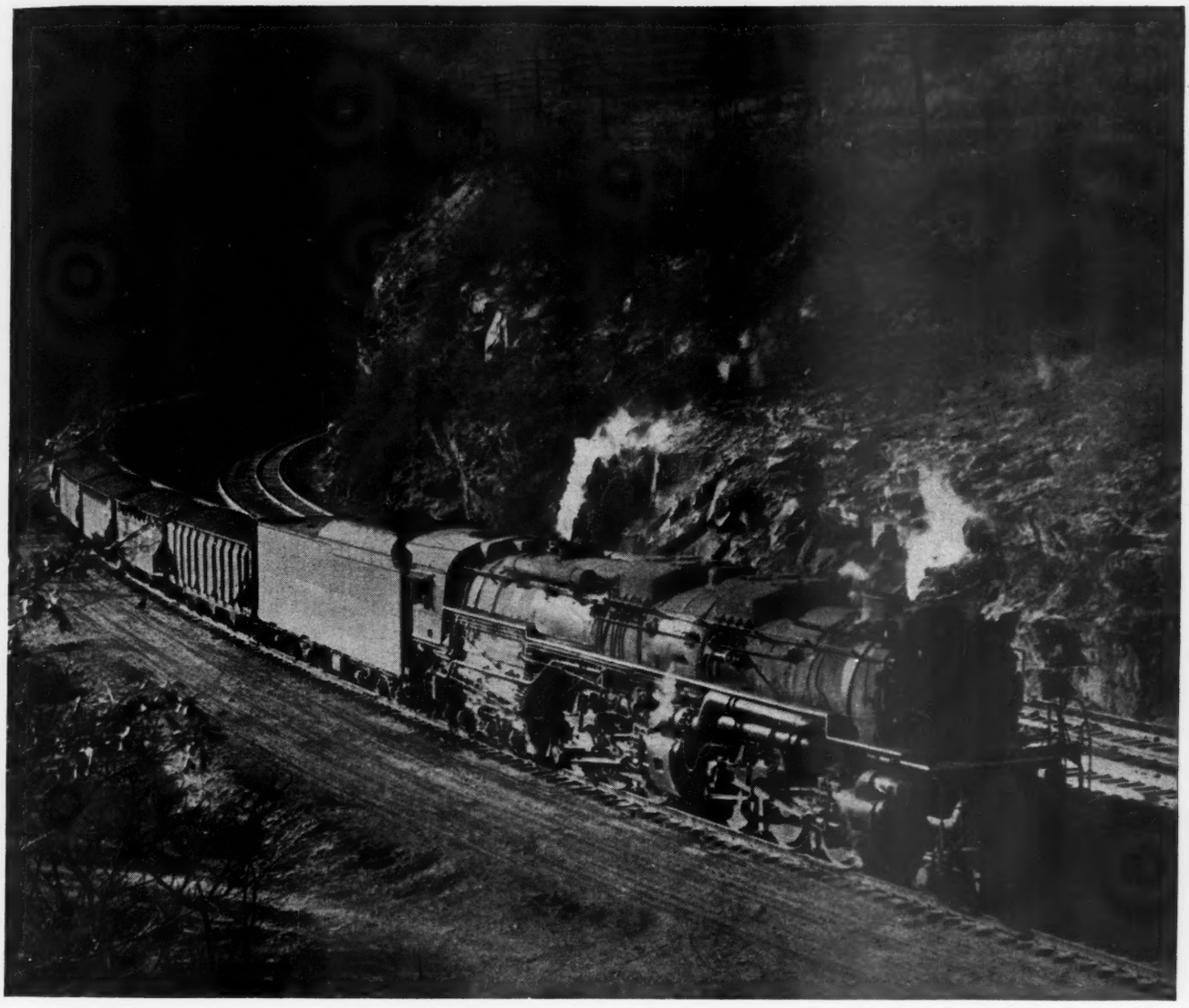
Abel H. Hillman, whose appointment as assistant engineer of bridges of the Pennsylvania at Philadelphia, Pa., was reported in the *Railway Age* of February 1, was born on November 3, 1891, at Camden, N. J.

Mr. Hillman attended the public schools of Haddonfield, N. J., and the University of Pennsylvania, from which he was graduated in 1914 with the degree of bachelor of science in civil engineering. During the summers of 1912 and 1913 Mr. Hillman was a member of the engineering corps of the

Abel H. Hillman

Pennsylvania and after graduating he represented the Portland Cement Association in the province of Quebec, Canada. Entering permanent service with the Pennsylvania on July 16, 1915, Mr. Hillman served as assistant on the engineer corps in the maintenance of way department at Logansport, Ind., rising to first corps man and

News Department continued on next left-hand page



traffic demands
must be anticipated

BECAUSE equipment can not be built "overnight," traffic demands must be anticipated for long periods in advance. So, versatile motive power is especially important—locomotives capable of speeding passenger traffic or handling heavy freights with equal facility and economy of operation.

Lima-built modern steam locomotives meet these requirements and provide the superior performance that results from Lima's insistence upon the highest standards of design, workmanship and material.

LIMA LOCOMOTIVE WORKS INCORPORATED, LIMA, OHIO

transferring to Chicago in 1922. He returned to Philadelphia in March, 1928, in the office of the engineer of bridges and buildings of the Eastern region, becoming assistant engineer of bridges last February 1.

F. A. Mackenroth, supervisor of telegraph of the Northern Pacific at Seattle, Wash., has been appointed assistant superintendent of telegraph, with the same headquarters, succeeding **C. W. Harding,** who has retired after 51 years of railroad service.

B. F. Mason has been appointed assistant superintendent of communications of the Minneapolis, St. Paul & Sault Ste. Marie, with headquarters at Minneapolis, Minn. The position of superintendent telegraph, Stevens Point division, has been abolished.

A. A. Visintainer, assistant engineer of structures of the Erie at Cleveland, Ohio, has been appointed engineer of structures, with the same headquarters, succeeding **H. A. Dise,** who has retired after 29 years of service. **W. R. Marshall** has been appointed assistant engineer of structures, and **P. C. Chamberlain** has been appointed assistant engineer, department of structures, both with headquarters at Cleveland.

Mr. Visintainer was born at Mount Carmel, Pa., on October 11, 1903, and graduated in civil engineering from Lehigh university in 1926, immediately following which he entered railway service in the engineering department of the Erie on construction work at Youngstown, Ohio. On July 1, 1929, he was advanced to inspector and on January 1, 1939, he was promoted to construction inspector, advancing to assistant engineer in the department structures on February 1, 1943. In December, 1944, he was promoted to assistant engineer of structures, at Cleveland, the position he held at the time of his recent appointment.

Mr. Dise was born at Glen Rock, Pa., on March 2, 1882, graduated in civil engineering from the University of Pennsylvania in 1906, and became a draftsman with the American Bridge Company at Elmira, N. Y., in June of the same year. In January, 1910, he entered railway service as a structural designer for the New York Central in connection with the electrification of the Hudson and Harlem divisions. Mr. Dise went with the Erie in September, 1918, as a structural designer, and on March 1, 1920, he was promoted to chief draftsman, with headquarters at New York, later being transferred to Cleveland. On February 1, 1943, he was advanced to assistant engineer of structures, and in December, 1944, he was promoted to engineer of structures, the position he held at the time of his retirement.

A. A. Visintainer

A. C. Hoyt, whose appointment as engineer of bridges and buildings of the Elgin, Joliet & Eastern, with headquarters at Joliet, Ill., was reported in the *Railway Age* of April 5, was born at Cedar Rapids, Iowa, on November 28, 1904, and was graduated by Iowa State College in 1927 with the degree B. S. in civil engineering. He entered railroad service in 1924 as a rodman on the Illinois Central, and after graduation from college served successively as inspector, instrumentman, and resident engineer of the Iowa state highway commission. Mr. Hoyt entered the service of the Chicago Great Western in 1937 as an assistant division engineer, at Des Moines, Iowa. In 1938 he was advanced to engineer of surveys, system, at Chicago, the position he held at the time of his recent appointment.

MECHANICAL

W. C. Bowra, superintendent of motive power and car equipment of the Canadian National, at Montreal, Que., has been appointed general superintendent of motive power and car equipment of the Grand Trunk Western (part of the C. N. System), with headquarters at Battle Creek, Mich. He succeeds **W. H. Clegg,** who has retired after 35 years of service with the road. **G. L. Galloway** has been appointed superintendent of motive power and car equipment of the Northern Ontario district at North Bay, Ont., succeeding **W. S. Davis,** who has been transferred to the Montreal district at Montreal, to succeed Mr. Bowra.

SPECIAL

R. L. Christopherson has been appointed assistant commissioner of the department of immigration and colonization of the Canadian Pacific, with headquarters at Montreal, Que., succeeding **James Colley,** who has been appointed resident representative in Canada of the inter-governmental committee on refugees.

OBITUARY

H. J. Devereux, general agent of the Illinois Terminal, with headquarters at New Orleans, La., died recently.

Robert P. McCord, assistant to the president of the Union Refrigerator Transit Company, Milwaukee, Wis., died on April 6.

George Bruce Burpee, general passenger agent of the Canadian Pacific at Vancouver, B. C., died on April 1 at St. Vincent's hospital in that city after an illness of several weeks, at the age of 63. Mr. Burpee was born at St. John, N. B., in 1884 and in 1904 he joined the Canadian Pacific as a clerk in the St. John ticket office. He served 43 years with that road, first as traveling passenger agent, until 1916, when he became general traveling passenger agent for the system at Montreal. He was appointed general agent at Cleveland in 1920 and two years later he was transferred back to St. John as district passenger agent. Mr. Burpee served at Toronto, Ont., from 1928 to 1936, when he went to Montreal as assistant general passenger agent. In October, 1937, he was appointed general passenger agent at Vancouver, B. C., the position he occupied until his death.

Herbert A. Stewart, who retired in 1939 as general mechanical inspector of the Fruit Growers Express at Alexandria, Va., died on April 3 at his home in that city, after a long illness. He was 75 years old.

Edward J. Engel, retired president and a member of the board of directors and executive committee of the Atchison, Topeka & Santa Fe, whose death was reported in the *Railway Age* of April 5, was born on July 28, 1874, at Havana, Ohio. He was educated in the public schools of Republic, Ohio, and Havana, and attended business college at Sandusky, Ohio. Shortly after entering the service of the Santa Fe in 1899 as a clerk in the purchasing department, Mr. Engel was transferred as a stenographer to the office of Edward P. Ripley, president of the road, with whom he was closely associated for many years. This association, coming at a time when the Santa Fe was emerging from a bankrupt property to an enviable position as one of the largest and most prosperous railway systems in the world, afforded Mr. Engel the executive experience which was to qualify him well for the road's presidency. In 1910, following seven years service as chief clerk, he was advanced to assistant to president. He was elected vice-president in 1918 and became executive vice-president in 1938. On March 28, 1939, he was elected president of the road and chairman of its executive committee, which position he retained until his retirement on August 1, 1944 (reported in the *Railway Age* of July 29, 1944, page 191). Funeral services for Mr. Engel were conducted on April 2, at Glendale, Cal., with interment there.

Edward J. Engel

Table of Revenues and Expenses begins on the next left-hand page.

From an Editorial in
RAILWAY MECHANICAL ENGINEER
—JANUARY, 1947

Steam Power Shows New Signs of Life

As 1946 passes into history and we review railroad operation for the year, we find that several interesting developments have been revealed during that year in the field of steam power.***

The operation of large 4-8-4 type locomotives with a total maintenance cost of only slightly more than 13 cents a mile over a four-year period shows definitely that the steam locomotive is not inherently expensive to maintain. Groups of steam locomotives given selected assignments and adequate servicing facilities, both en route and at terminals, average over 25,000 miles a month.***

Nor should it be forgotten that the steam locomotive of present day design can easily pack more than 5,000 drawbar horsepower in four axles and 5,000 horsepower carries a lot of weight maintaining even the fastest and most rigid of schedules.***

The steam locomotive design of today is not static. In addition to innumerable minor improvements that are being continuously made, there are two major developments that appear destined to have a marked effect on future locomotive design. Welded boilers*** The poppet valve gear may prove to be the answer to the problems of rising fuel prices and the rapid drop in horsepower that occurs in steam locomotives at high speeds. Thus it is apparent that the events of the past year, coupled with a look into the future, give a pretty strong indication that the steam locomotive will be with us for many years to come and that in the future it will give better and better service at lower and lower cost.

•

The Franklin System of Steam Distribution does prevent the rapid drop in horsepower that occurs with piston-valve locomotives. Actual test plant records show that IHP falls off less than 4% from 70 mph to 100 mph with poppet valves.

•

It is also true, however, that IHP is *also substantially increased.* The gain in drawbar pull, compared with similar piston-valve locomotives, has been as much as 24% at 60 mph and *44% at 80 mph.*

•

This greater horsepower is developed *with no increase in steam consumption.* It is produced solely by greater efficiency in converting steam into power. Therefore, at all power except maximum, there will be substantial savings in fuel and water — and, with lower steam demands on the boiler, *real reductions in boiler maintenance cost.*

Comprehensive test-plant data is available to show what the Franklin System of Steam Distribution can do on a modern, well-designed locomotive. With these data, and data available from other extensive tests, it is possible to calculate, with a high degree of accuracy, the increase in power and the saving in steam and fuel which can be realized with any specific locomotive design — existing or under development.

FRANKLIN RAILWAY SUPPLY COMPANY, INC.

NEW YORK • CHICAGO • MONTREAL

STEAM DISTRIBUTION SYSTEM • BOOSTER • RADIAL BUFFER • COMPENSATOR AND SNUBBER • POWER REVERSE GEARS
AUTOMATIC FIRE DOORS • DRIVING BOX LUBRICATORS • STEAM GRATE SHAKERS • FLEXIBLE JOINTS • CAR CONNECTION

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF FEBRUARY AND TWO MONTHS OF CALENDAR YEAR 1947

Name of road		Av. mileage operated during period	Operating revenues: Freight	Passenger	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures	Maintenance of Equipment	Traffic	Transportation	Total	Operating ratio	Net from railway operation	Railway tax accruals	Net railway operating income 1947	1946
Akron, Canton & Youngstown	Feb.	171	$383,026	$62	$397,084	$73,491	$37,007	$22,865	$124,305	$277,298	69.8	$119,786	$47,100	$56,670	$28,643
	2 mos.	171	819,869	129	855,083	143,294	80,037	45,392	255,320	563,708	65.9	291,375	116,619	141,325	66,551
Alton	Feb.	959	1,637,419	352,616	2,301,611	370,658	350,308	76,961	930,576	1,864,876	81.0	436,735	140,137	119,129	182,691
	2 mos.	959	3,338,076	792,069	4,785,160	760,231	691,122	156,786	1,896,731	3,794,563	79.3	990,597	390,842	235,555	354,950
Atchison, Topeka & Santa Fe System	Feb.	13,107	25,647,599	3,703,054	32,093,669	4,418,030	6,421,224	775,756	11,087,164	24,143,196	75.2	7,950,473	4,532,713	3,621,271	5,111,016
	2 mos.	13,107	53,195,027	7,847,378	66,862,366	9,198,105	12,751,618	1,479,601	23,286,330	49,723,993	74.4	17,138,373	9,536,606	8,050,969	11,724,836
Atlanta & St. Andrews Bay	Feb.	82	157,276	619	162,731	19,431	18,276	6,680	43,616	96,485	59.3	66,246	28,855	25,631	8,232
	2 mos.	82	306,936	2,195	318,640	38,106	32,562	12,898	85,708	187,969	59.0	130,671	57,750	51,100	10,881
Atlanta & West Point	Feb.	93	233,439	32,653	302,549	49,811	44,963	12,705	157,525	285,700	94.4	16,849	14,838	—17,266	11,536
	2 mos.	93	472,769	101,087	648,366	93,970	94,166	25,907	324,065	581,412	89.7	66,954	40,837	—12,931	18,582
Western of Alabama	Feb.	133	228,839	49,520	307,732	35,017	56,279	12,171	138,085	260,013	84.5	47,719	32,012	15,379	25,728
	2 mos.	133	470,616	115,917	646,651	83,893	115,042	24,798	285,322	546,733	84.5	99,918	67,064	32,113	50,073
Atlantic Coast Line	Feb.	5,573	8,215,910	2,345,797	11,422,928	2,122,237	1,737,314	257,949	4,440,810	9,081,980	79.5	2,340,948	1,000,000	877,190	969,349
	2 mos.	5,573	17,134,860	4,786,456	23,697,389	4,388,079	3,646,432	532,457	9,245,949	18,867,330	79.6	4,830,059	2,100,000	1,916,559	1,887,268
Charleston & Western Carolina	Feb.	343	351,119	3,190	364,049	63,233	57,317	12,619	138,668	280,457	77.0	83,592	30,000	48,978	5,972
	2 mos.	343	730,884	8,165	758,032	137,807	125,804	25,105	284,237	589,925	77.8	168,107	60,000	98,793	—20,552
Baltimore & Ohio	Feb.	6,192	22,504,965	1,755,931	25,743,868	2,925,599	5,643,696	660,256	11,522,677	21,933,435	85.2	3,810,433	1,653,047	1,985,662	785,764
	2 mos.	6,192	46,919,182	3,886,866	53,959,357	6,138,912	11,625,628	1,238,740	23,471,653	44,904,117	83.2	9,055,240	3,954,155	4,720,905	2,043,968
Staten Island Rapid Transit	Feb.	29	144,200	95,357	248,675	45,794	35,370	1,396	144,283	248,801	100.1	—126	39,418	—54,382	—32,167
	2 mos.	29	304,972	200,562	524,766	94,643	70,581	2,853	300,680	514,766	98.1	10,000	81,193	—106,347	—85,660
Bangor & Aroostook	Feb.	602	1,148,589	49,603	1,227,439	223,659	165,592	6,645	361,535	795,911	64.8	431,528	186,203	228,605	140,700
	2 mos.	602	2,155,990	98,701	2,314,528	436,001	354,330	14,543	722,282	1,606,439	69.4	708,089	310,102	387,049	376,149
Bessemer & Lake Erie	Feb.	214	880,548	1,486	895,088	103,597	405,322	15,883	319,697	892,932	99.8	2,156	160,852	164,841	—21,769
	2 mos.	214	1,916,739	3,001	1,947,270	205,363	843,743	31,234	640,581	1,816,207	93.3	131,063	349,626	455,428	36,643
Boston & Maine	Feb.	1,762	4,650,522	1,215,797	6,387,193	1,076,716	1,010,802	87,665	2,685,321	5,121,451	80.2	1,265,742	561,594	412,556	427,569
	2 mos.	1,762	9,611,593	2,458,078	13,190,565	2,238,516	2,138,237	180,624	5,689,059	10,811,367	82.0	2,379,198	1,111,030	692,443	916,941
Burlington-Rock Island	Feb.	228	249,299	43,417	314,049	35,266	35,705	3,621	133,716	225,917	71.9	88,132	11,011	18,116	40,781
	2 mos.	228	442,936	100,111	586,460	76,389	69,085	8,022	255,812	444,140	75.7	142,320	21,126	17,793	62,512
Cambria & Indiana	Feb.	35	138,458	.....	138,524	10,508	90,406	625	21,780	130,654	94.3	7,870	80,003	24,928	84,566
	2 mos.	35	298,599	.....	298,725	21,515	183,336	1,349	44,144	266,152	89.1	32,573	134,481	91,684	171,861
Canadian Pacific Lines in Maine	Feb.	234	568,241	39,606	625,622	74,465	80,418	7,021	219,841	394,599	63.1	231,023	26,942	117,740	124,277
	2 mos.	234	1,098,791	88,249	1,231,145	150,677	159,203	12,419	456,505	803,162	65.2	427,983	53,867	193,426	227,434
Canadian Pacific Lines in Vermont	Feb.	90	118,281	18,936	155,443	36,589	30,924	4,849	129,032	207,637	133.6	—52,194	15,594	—112,607	—109,967
	2 mos.	90	246,799	36,403	325,856	81,500	61,752	8,271	270,142	434,428	133.3	—108,572	30,667	—223,203	—222,018
Central of Georgia	Feb.	1,815	2,040,826	271,425	2,545,023	466,046	456,995	99,569	1,271,852	2,446,576	96.1	98,447	242,390	—132,103	83,910
	2 mos.	1,815	4,113,952	546,717	5,136,458	929,815	943,550	195,961	2,595,110	4,973,889	96.8	162,569	489,917	—323,926	346,086
Central of New Jersey	Feb.	419	1,999,117	417,813	2,637,391	402,384	495,881	46,581	1,505,159	2,603,211	98.7	34,180	369,432	—600,167	—415,986
	2 mos.	419	4,167,342	836,230	5,506,223	770,987	1,013,295	95,302	3,116,115	5,316,144	96.5	190,078	744,186	—1,106,801	—609,644
Central of Pennsylvania	Feb.	213	1,239,650	19,805	83,637	118,578	276,274	19,568	465,641	914,335	71.2	369,302	57,771	503,975	48,144
	2 mos.	213	2,657,669	39,251	2,747,945	234,560	561,571	41,283	959,437	1,870,087	68.1	877,858	126,545	1,123,178	97,974
Central of Vermont	Feb.	422	686,000	70,000	819,625	125,357	131,656	12,309	335,435	639,117	78.0	180,508	49,428	73,672	—8,213
	2 mos.	422	1,318,000	145,000	1,580,057	244,466	277,759	23,421	720,037	1,335,821	84.5	244,236	104,303	24,650	—75,411
Chesapeake & Ohio	Feb.	3,106	17,203,830	592,764	18,422,079	2,545,308	3,342,162	353,591	6,140,432	13,041,756	70.8	5,380,323	2,966,424	3,247,049	3,644,146
	2 mos.	3,106	36,507,649	1,261,664	39,004,977	5,021,145	6,938,186	756,786	12,431,695	26,527,329	68.0	12,477,648	6,548,525	7,438,058	7,267,880
Chicago & Eastern Illinois	Feb.	910	1,629,204	281,634	2,129,629	279,504	384,878	70,300	1,011,618	1,852,769	87.0	276,860	144,500	35,462	—127,695
	2 mos.	910	3,359,017	635,563	4,447,936	606,883	863,914	148,953	2,059,414	3,908,003	87.9	539,933	283,300	42,579	—97,821
Chicago & Illinois Midland	Feb.	131	597,808	806	622,823	66,317	112,302	22,381	162,575	391,517	62.9	231,306	106,724	131,613	78,177
	2 mos.	131	1,241,083	1,806	1,303,902	140,379	240,589	52,156	358,647	851,639	65.3	452,263	202,382	245,349	155,391
Chicago & North Western	Feb.	8,064	8,970,672	1,697,737	12,087,287	2,022,738	2,704,906	258,785	5,906,296	11,498,637	95.1	588,650	1,050,702	—811,603	631,921
	2 mos.	8,064	18,756,634	3,633,975	25,384,954	4,045,361	5,323,752	527,934	12,183,493	23,321,364	91.9	2,063,590	2,135,074	—668,247	1,486,217
Chicago, Burlington & Quincy	Feb.	8,868	14,264,663	1,200,952	16,866,341	1,755,824	2,255,135	344,820	5,622,821	10,528,544	62.4	6,337,797	2,858,831	3,101,763	3,468,326
	2 mos.	8,868	28,622,657	2,605,348	34,319,681	3,648,462	4,655,150	682,641	11,499,534	21,633,597	63.0	12,686,084	5,775,323	6,232,051	8,662,945
Chicago Great Western	Feb.	1,500	1,966,359	67,312	2,211,312	191,996	299,540	74,589	1,088,060	1,715,312	77.6	496,000	149,513	147,109	—43,033
	2 mos.	1,500	4,112,921	152,689	4,677,244	466,944	644,490	152,257	2,246,318	3,656,429	78.2	1,020,815	327,218	317,021	—76,829
Chicago, Indianapolis & Louisville	Feb.	541	954,553	56,414	1,077,988	261,465	169,379	51,805	472,128	1,014,247	94.1	63,741	73,110	—108,978	1,087
	2 mos.	541	1,992,716	118,307	2,255,303	527,602	348,902	103,361	968,229	2,073,491	91.9	181,812	152,521	—180,796	19,716

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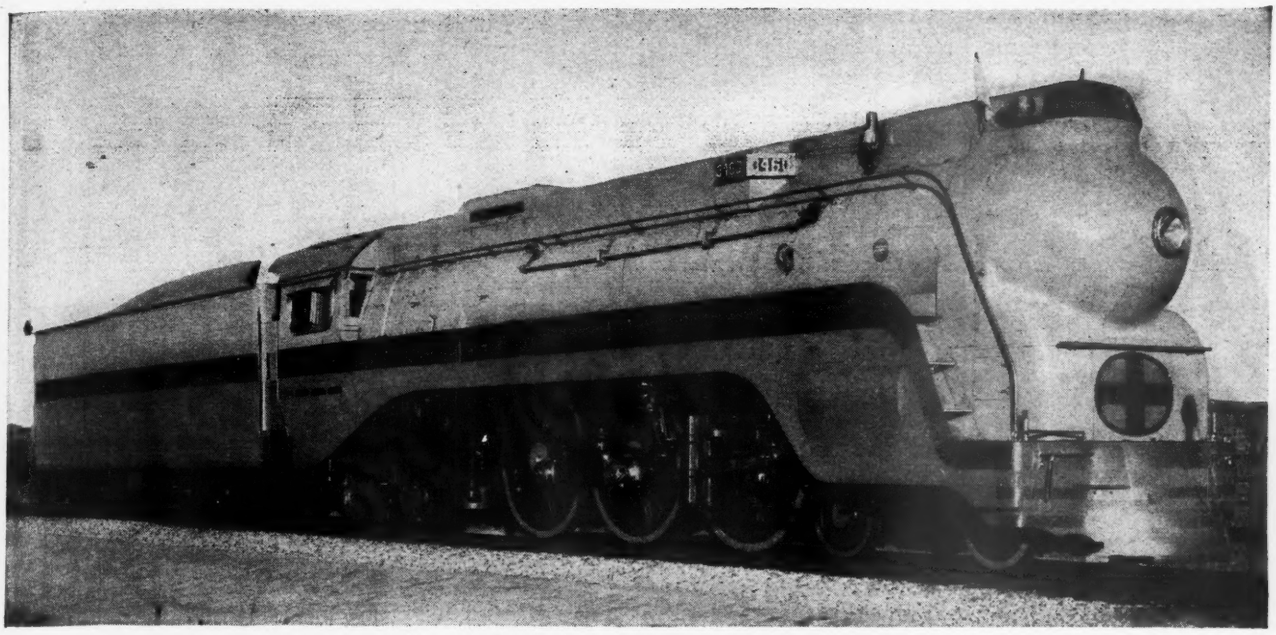

Streamlined Motive Power

STREAMLINES ITS WATER CIRCULATION

Security Circulators, in this oil-burning steam locomotive, produce a continuous flow of water from the side water-legs, through the Circulators over the center of the crown sheet.

Located right in the path of the hot gases, they also add a very effective heating area for speeding evaporation, thus improving the locomotive's steaming efficiency.

Security Circulators are applicable to either oil- or coal-burning locomotives and are being installed in existing locomotives as well as in new motive power.

AMERICAN ARCH COMPANY, INC.

NEW YORK • CHICAGO

SECURITY CIRCULATOR DIVISION

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF FEBRUARY AND TWO MONTHS OF CALENDAR YEAR 1947—CONTINUED

Name of road		Av. mileage operated during period	Operating revenues: Freight	Passenger	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures	Maintenance of Equipment	Traffic	Transportation	Total	Operating ratio	Net from railway operation	Railway tax-accruals	Net railway operating income 1947	1946
Chicago, Milwaukee, St. Paul & Pacific	Feb.	10,733	$13,369,163	$1,434,257	$16,272,651	$2,063,955	$2,712,013	$300,986	$7,182,656	$12,996,429	79.9	$3,276,222	$1,470,000	$1,129,179	$1,201,252
	2 mos.	10,733	27,541,954	3,116,177	33,881,416	4,151,090	5,581,820	648,502	15,021,406	26,981,690	79.6	6,899,726	3,202,000	2,606,340	3,405,240
Chicago, Rock Island & Pacific	Feb.	7,650	10,249,528	1,597,890	12,850,704	1,347,386	2,177,723	399,750	5,137,140	9,719,236	75.6	3,131,468	1,110,722	1,339,414	1,353,565
	2 mos.	7,650	21,268,037	3,514,423	26,887,108	2,730,824	4,459,875	796,669	10,577,615	19,900,119	74.0	6,986,989	2,583,623	3,142,088	3,914,320
Chicago, St. Paul, Minn. & Omaha	Feb.	1,616	1,857,569	191,032	2,246,332	330,294	390,966	49,211	1,120,327	1,985,639	88.4	260,693	177,775	—75,241	—207,942
	2 mos.	1,616	3,887,472	421,451	4,749,466	672,612	794,616	100,658	2,387,039	4,151,317	87.4	598,149	370,937	—42,837	—201,625
Clinchfield	Feb.	302	1,424,956	5,466	1,440,671	84,540	215,840	27,585	374,018	726,830	50.5	713,841	143,640	607,040	511,954
	2 mos.	302	3,010,656	11,288	3,045,762	188,628	443,161	55,253	759,725	1,495,851	49.1	1,549,911	288,142	1,362,043	867,883
Colorado & Southern	Feb.	748	736,783	94,859	915,711	120,932	156,729	20,537	380,353	721,308	78.8	194,403	119,856	62,124	33,628
	2 mos.	748	1,501,243	218,759	1,897,190	246,513	341,461	41,629	796,735	1,518,371	80.0	378,819	235,690	106,345	80,002
Ft. Worth & Denver City	Feb.	902	701,184	120,306	902,428	133,499	149,102	31,657	333,069	705,756	78.2	196,672	73,078	95,045	81,352
	2 mos.	902	1,428,411	278,203	1,884,692	251,819	317,115	63,528	721,427	1,481,087	78.6	403,605	174,499	216,393	209,118
Colorado & Wyoming	Feb.	42	104,680	.....	170,846	7,596	14,047	777	60,884	89,917	52.6	80,929	40,391	40,940	—28,580
	2 mos.	42	181,021	.....	312,874	16,038	30,497	1,510	123,001	182,777	58.4	130,097	71,918	58,683	—11,836
Columbus & Greenville	Feb.	168	144,102	1,992	157,006	27,749	26,721	4,746	58,651	132,501	84.4	24,505	11,792	12,148	7,168
	2 mos.	168	279,837	4,725	306,368	54,735	57,077	9,452	119,133	269,275	87.9	37,093	24,264	12,647	7,877
Delaware & Hudson	Feb.	794	3,615,614	123,411	3,863,356	478,759	852,011	60,505	1,588,780	3,122,242	80.8	741,114	400,747	311,871	360,735
	2 mos.	794	7,473,541	352,877	8,082,096	969,879	1,772,789	118,175	3,348,296	6,510,993	80.6	1,571,103	856,690	687,604	783,384
Delaware, Lackawanna & Western	Feb.	973	4,514,796	757,526	5,742,465	684,987	955,552	139,493	2,748,692	4,726,090	82.3	1,016,375	519,330	408,612	493,630
	2 mos.	973	9,475,407	1,583,985	12,088,134	1,352,167	2,043,603	268,397	5,810,525	9,889,344	81.8	2,198,790	1,116,346	895,345	1,061,556
Denver & Rio Grande Western	Feb.	2,366	3,499,874	192,146	3,854,045	370,455	819,809	117,762	1,495,077	2,984,242	77.4	869,803	335,498	547,365	697,682
	2 mos.	2,366	6,939,683	466,313	7,759,814	781,860	1,809,064	239,766	3,197,035	6,405,432	82.5	1,354,382	686,069	704,747	1,402,929
Denver & Salt Lake	Feb.	232	348,567	5,962	365,068	43,671	59,926	3,816	124,669	244,577	67.0	120,491	37,790	125,857	65,735
	2 mos.	232	755,124	12,857	788,942	85,843	124,380	8,251	269,034	513,533	65.1	275,409	76,683	282,481	152,157
Detroit & Mackinac	Feb.	230	114,087	1,866	125,715	14,810	14,851	776	33,228	69,390	55.2	56,325	17,812	36,954	2,929
	2 mos.	230	230,224	3,500	254,691	33,477	27,579	1,439	68,748	142,712	56.0	111,979	32,754	68,206	25,760
Detroit & Toledo Shore Line	Feb.	50	557,218	.....	558,951	33,536	36,074	11,348	150,662	341,233	43.2	317,718	96,148	110,434	54,440
	2 mos.	50	1,085,960	.....	1,091,121	67,138	67,385	22,053	299,284	476,399	43.7	614,722	190,447	217,880	106,909
Detroit, Toledo & Ironton	Feb.	464	1,096,604	706	1,145,251	107,200	166,043	18,828	281,191	602,563	52.6	542,688	220,265	291,953	155,999
	2 mos.	464	2,317,689	1,615	2,421,274	224,077	337,485	37,687	576,770	1,234,933	51.0	1,186,341	470,633	634,210	351,446
Duluth, Missabe & Iron Range	Feb.	547	218,067	1,985	251,599	296,812	406,966	5,884	328,402	1,087,456	432.2	—835,857	70,929	—901,482	—749,500
	2 mos.	547	352,237	4,608	420,054	665,491	804,705	11,113	619,077	2,197,520	523.2	—1,777,466	141,009	—1,930,775	—1,655,036
Duluth, Winnipeg & Pacific	Feb.	175	273,000	1,200	279,900	42,536	39,597	3,020	125,045	214,817	76.7	65,083	24,472	6,569	7,310
	2 mos.	175	564,000	2,500	577,100	78,837	80,173	5,901	262,503	437,660	75.8	139,440	50,586	21,785	31,951
Elgin, Joliet & Eastern	Feb.	391	2,436,956	*6	2,880,847	169,126	400,410	21,025	1,207,942	1,877,195	65.2	1,003,652	410,051	320,739	—287,922
	2 mos.	391	5,098,463	2	6,045,541	328,381	796,425	40,470	2,510,956	3,841,683	63.5	2,203,858	877,757	796,002	—317,956
Erie	Feb.	2,229	9,905,502	495,937	11,053,487	1,078,202	2,073,779	251,733	5,156,219	9,093,645	82.3	1,959,842	939,871	634,425	—670,150
	2 mos.	2,229	20,432,448	1,055,055	22,903,629	2,154,707	4,326,925	498,688	10,515,255	18,562,170	81.0	4,341,459	2,025,365	1,470,458	—597,042
Florida East Coast	Feb.	682	1,540,595	1,032,606	2,833,691	418,189	343,582	56,794	941,382	1,934,084	68.3	899,607	257,988	473,154	534,362
	2 mos.	682	3,388,919	2,026,958	5,938,713	812,228	751,476	116,535	2,002,581	4,028,745	67.8	1,909,968	561,605	1,035,472	1,222,812
Georgia Railroad	Feb.	328	566,026	17,573	628,332	106,125	116,811	26,302	337,501	612,909	97.5	15,423	46,924	—20,612	25,081
	2 mos.	328	1,157,308	52,502	1,294,422	184,510	241,811	52,489	691,274	1,221,871	94.4	72,551	96,027	1,191	—13,632
Georgia & Florida	Feb.	408	176,629	1,052	182,890	28,589	20,640	12,633	78,975	149,998	82.0	32,892	13,339	6,885	—2,797
	2 mos.	408	373,280	4,057	387,976	84,677	49,794	24,307	163,407	339,923	87.6	48,053	29,189	—7,179	—4,952
Grand Trunk Western	Feb.	972	2,840,000	150,000	3,209,000	478,200	547,061	52,193	1,525,253	2,717,207	84.7	491,793	246,102	99,521	—266,213
	2 mos.	972	5,908,000	336,000	6,652,000	943,270	1,114,804	99,799	3,127,318	5,528,087	83.1	1,123,913	500,094	361,503	—406,397
Canadian Nat'l Lines in New England	Feb.	172	165,000	6,900	184,400	44,569	25,151	2,555	106,758	186,752	101.3	—2,352	25,558	—60,688	—115,576
	2 mos.	172	340,000	15,900	377,000	99,349	57,199	5,012	221,740	398,592	105.7	—21,592	51,116	—132,385	—182,874
Great Northern	Feb.	8,332	10,239,751	689,167	11,813,373	2,258,448	2,505,979	311,858	4,786,556	10,349,116	87.6	1,464,257	1,247,067	294,731	545,432
	2 mos.	8,332	21,357,049	1,443,740	24,634,197	4,532,744	5,175,695	614,398	10,123,588	21,469,325	87.2	3,164,872	2,578,872	605,771	1,584,666
Green Bay & Western	Feb.	234	232,150	42	238,174	37,290	28,537	13,159	79,338	169,118	71.0	69,056	28,579	31,612	6,299
	2 mos.	234	456,556	83	468,459	77,889	61,720	26,928	162,836	352,523	75.2	115,936	55,035	42,056	26,087

* Debit.

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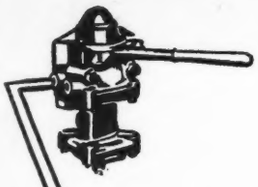

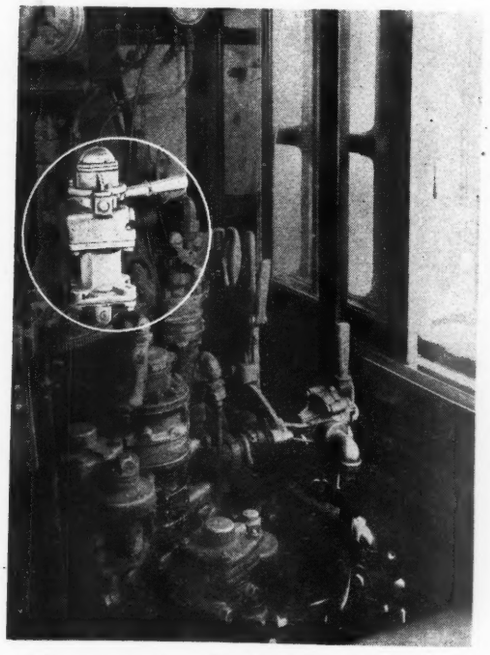

Representative Application of Hand Throttle Lever.

The Throttle Control of *Tomorrow* . . . Available *Now*

As dependable as the air brake. With the Throttle Master the engineman can "master" slipping drivers. It is light in weight and foot control is ideal for switching service.

A-1849
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AMERICAN THROTTLE COMPANY
INCORPORATED
60 East 42nd Street, New York 17, N. Y.
122 S. Michigan Avenue, Chicago 3, Ill.

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF FEBRUARY AND TWO MONTHS OF CALENDAR YEAR 1947—CONTINUED

Name of road		Av. mileage operated during period	Operating revenues			Operating expenses					Operating ratio	Net from railway operation	Railway tax-accruals	Net railway operating income	
			Freight	Passenger	Total (inc. misc.)	Maintenance of Way and structures	Maintenance of Equipment	Traffic	Transportation	Total				1947	1946
Gulf, Mobile & Ohio	Feb.	1,945	$3,089,698	$80,907	$3,281,394	$553,800	$571,148	$106,490	$986,433	$2,361,345	72.0	$920,049	$365,928	$352,294	$218,350
	2 mos.	1,945	6,090,222	178,894	6,486,650	1,095,312	1,139,647	212,702	2,010,945	4,754,359	73.3	1,732,291	693,072	629,181	474,951
Illinois Central (System)	Feb.	6,582	14,842,797	1,928,990	18,511,762	2,768,348	3,338,503	337,342	6,795,990	14,056,737	75.9	4,455,025	2,283,667	1,941,506	2,650,564
	2 mos.	6,582	30,484,334	4,051,831	37,999,609	5,720,632	6,657,404	680,961	14,104,365	28,836,270	75.9	9,163,339	4,674,790	3,906,165	3,992,833
Illinois Terminal	Feb.	476	660,577	113,867	854,361	109,411	112,771	24,831	319,362	599,905	70.22	254,456	110,769	108,040	83,466
	2 mos.	476	1,405,909	246,072	1,819,820	233,215	242,872	50,633	669,779	1,263,403	69.42	556,417	243,609	249,506	182,896
Kansas City Southern	Feb.	890	2,382,199	65,803	2,655,564	283,886	353,967	68,096	801,172	1,610,203	60.6	1,045,361	391,000	496,370	470,802
	2 mos.	890	4,824,507	156,550	5,406,321	622,608	710,969	139,987	1,687,011	3,369,813	62.3	2,036,508	696,000	1,033,236	894,324
Kansas, Oklahoma & Gulf	Feb.	328	380,061	1,061	385,013	24,747	24,012	13,521	97,821	173,738	45.1	211,275	83,505	102,564	61,632
	2 mos.	328	766,922	2,338	777,804	47,436	52,904	27,411	201,968	357,657	46.0	420,147	164,811	198,245	140,573
Lake Superior & Ishpeming	Feb.	156	56,635	75	59,276	29,868	40,407	1,437	34,979	114,861	193.8	—55,585	23,607	—71,869	—85,667
	2 mos.	156	112,184	168	117,431	56,029	85,122	2,952	72,582	233,149	198.5	—115,698	47,681	—149,937	—166,149
Lehigh & Hudson River	Feb.	96	287,844	.....	288,769	35,410	38,280	6,625	95,786	184,159	63.8	104,610	40,584	37,557	27,537
	2 mos.	96	564,154	.....	566,158	71,917	77,505	13,463	192,829	372,908	65.9	193,250	75,332	69,204	45,177
Lehigh & New England	Feb.	193	342,981	.....	346,240	59,441	86,808	10,145	153,651	334,627	96.6	11,613	27,899	13,716	86,019
	2 mos.	193	866,572	.....	877,656	124,830	179,104	21,306	339,148	714,301	81.4	163,355	106,453	100,479	163,284
Lehigh Valley	Feb.	1,254	4,777,685	352,560	5,517,586	664,118	921,221	130,644	2,621,325	4,574,193	82.9	943,393	267,405	501,312	681,410
	2 mos	1,254	10,109,122	763,698	11,675,839	1,379,049	1,898,689	260,783	5,480,401	9,500,337	81.4	2,175,502	741,313	1,124,411	1,324,698
Louisiana & Arkansas	Feb.	756	1,132,901	40,110	1,223,679	166,564	129,007	36,590	374,766	747,047	61.0	476,632	189,050	204,124	195,475
	2 mos.	756	2,283,961	85,177	2,472,027	334,047	261,315	75,120	767,434	1,520,566	61.5	951,461	383,054	408,075	350,138
Louisville & Nashville	Feb.	4,768	12,814,642	1,180,981	14,867,231	1,921,178	3,103,632	267,991	6,147,154	11,987,460	80.6	2,879,771	1,904,533	1,383,905	2,405,670
	2 mos.	4,768	26,179,440	2,538,088	30,592,254	3,983,625	6,295,141	540,181	12,687,644	24,624,747	80.5	5,967,507	4,030,680	2,937,138	4,547,300
Maine Central	Feb.	988	1,640,473	169,496	1,901,934	287,072	339,859	15,432	743,079	1,444,724	76.0	457,210	206,065	177,820	190,257
	2 mos.	988	3,302,131	340,017	3,853,922	617,359	656,846	32,632	1,567,548	2,995,506	77.7	858,416	359,842	336,619	340,777
Midland Valley	Feb.	334	145,507	*19	148,253	23,072	12,057	2,726	46,556	90,722	61.2	57,531	18,936	30,577	18,704
	2 mos.	334	297,536	2	302,932	43,080	24,710	5,869	94,700	181,087	59.8	121,845	52,808	57,192	35,327
Minneapolis & St. Louis	Feb.	1,408	1,278,987	8,486	1,342,493	203,365	208,707	81,101	449,270	1,008,992	75.2	333,501	189,884	118,788	29,716
	2 mos.	1,408	2,587,167	20,905	2,714,731	407,121	433,132	167,326	921,671	2,072,983	76.4	641,748	369,825	246,179	93,551
Minneapolis, St. Paul & S. S. Marie	Feb.	3,224	1,675,433	90,147	1,885,710	384,372	425,823	46,494	990,698	1,931,818	102.4	—46,108	185,446	—253,850	—346,806
	2 mos.	3,224	3,585,939	191,525	4,049,624	772,140	863,916	98,394	2,085,364	3,989,779	98.5	59,845	373,635	—308,333	—365,539
Duluth, South Shore & Atlantic	Feb.	530	356,186	11,418	386,342	83,828	64,275	14,727	179,959	351,100	90.9	35,242	24,892	1,601	12,745
	2 mos.	530	686,547	23,663	749,498	159,798	132,900	29,519	348,953	689,170	92.0	60,328	50,119	—4,458	24,158
Spokane International	Feb.	152	129,902	1,928	141,148	31,189	14,854	3,404	48,787	104,999	74.4	36,149	11,615	10,743	9,739
	2 mos.	152	270,911	3,924	294,942	64,190	30,869	7,754	102,655	219,551	74.4	75,391	28,814	21,739	20,676
Mississippi Central	Feb.	148	150,246	*21	154,912	35,049	15,466	10,406	38,023	106,593	68.8	48,319	13,179	21,313	6,562
	2 mos.	148	291,141	279	300,506	71,383	33,477	21,294	77,238	218,537	72.7	81,969	28,052	25,699	4,638
Missouri & Arkansas	Feb.														
	2 mos.														
Missouri-Illinois	Feb.	172	279,976	296	283,798	37,437	31,937	5,751	69,513	152,115	53.6	131,683	59,062	67,105	40,235
	2 mos.	172	554,473	648	563,794	74,379	68,610	12,601	148,669	319,238	56.6	244,556	109,017	121,815	86,112
Missouri-Kansas-Texas Lines	Feb.	3,253	4,153,560	349,558	4,915,620	714,150	735,195	191,125	1,949,640	3,826,982	77.9	1,088,638	498,726	414,546	668,787
	2 mos.	3,253	8,241,723	758,568	9,890,231	1,425,485	1,511,611	391,505	4,049,779	7,881,439	79.7	2,008,792	910,335	666,605	1,352,820
Missouri Pacific	Feb.	7,037	12,728,434	1,307,092	15,281,588	1,876,030	2,515,279	336,660	5,868,690	11,169,885	73.1	4,111,703	1,325,473	2,146,292	2,536,210
	2 mos.	7,037	25,998,602	2,762,154	31,345,201	3,960,803	5,272,964	705,847	12,067,148	23,181,918	73.9	8,163,283	2,703,039	4,301,861	4,575,186
Gulf Coast Lines	Feb.	1,734	3,211,093	85,092	3,439,152	672,175	364,073	65,227	1,042,115	2,244,786	65.3	1,194,366	240,286	634,784	805,909
	2 mos.	1,734	6,211,496	183,660	6,700,749	1,288,587	726,547	132,972	2,167,339	4,521,989	67.5	2,178,760	418,431	1,119,694	1,637,350
International-Great Northern	Feb.	1,110	1,761,364	188,170	2,202,445	426,443	344,178	40,976	992,474	1,915,478	87.0	286,967	122,400	—19,484	214,896
	2 mos.	1,110	3,549,518	425,789	4,481,575	859,407	693,248	86,770	2,029,119	3,904,366	87.1	577,209	251,841	—10,172	424,684
Monongahela	Feb.	170	541,913	1,063	548,326	51,649	55,767	771	176,992	289,463	52.8	258,863	65,252	110,911	134,348
	2 mos.	170	1,222,879	2,323	1,234,450	113,501	119,886	1,516	369,793	613,156	49.7	621,294	132,037	304,051	262,285

* Debit

Table continued on second left-hand page.

Powering Baltimore & Ohio's fleet of feature trains, these 22 General Motors Diesel locomotives, ranging from 1,800 to 4,000 horsepower, have met their assigned mileage 96.3% of the time — averaging 19,149 miles a month per unit.

Performance Records on Baltimore & Ohio Railroad

Locomotive Number	Date Delivered	Miles Operated	Miles Assigned	Miles Operated per Month	% Availability
51	*5-37	1,918,127	2,029,654	17,874	94.5
52	*6-37	1,936,349	2,035,562	18,144	95.1
53	1-38	2,013,908	2,106,784	18,647	95.6
54	1-38	1,982,744	2,065,641	18,359	96.0
55	6-38	2,022,246	2,115,802	19,633	95.6
56	6-38	2,043,546	2,131,764	19,840	95.9
57	9-40	1,452,362	1,558,135	19,110	93.2
58	9-40	1,514,170	1,578,446	19,923	95.9
59	9-40	1,541,116	1,590,904	20,278	96.9
60	6-41	1,159,080	1,181,045	17,300	98.1
61	7-41	1,258,725	1,268,358	19,072	99.2
62	7-41	1,382,553	1,402,327	20,948	98.6
63	7-41	1,362,575	1,400,233	20,645	97.3
64	2-45	449,079	473,015	19,525	94.9
66	2-45	453,911	461,455	19,735	98.4
68	9-45	277,478	289,570	17,342	95.8
70	9-45	279,655	283,683	17,478	98.6
72	10-45	288,109	289,901	19,207	99.4
74	10-45	277,856	285,472	18,524	97.3
76	10-45	280,775	284,359	18,718	98.7
78	10-45	324,378	326,170	21,625	99.5
80	10-45	330,887	332,679	22,059	99.5
		24,549,629	25,490,959	423,986	96.3

*Miles assigned figures not available until February 1938, and miles operated, therefore, computed from that date.

GENERAL MOTORS LOCOMOTIVES

ELECTRO-MOTIVE DIVISION

GENERAL MOTORS — LA GRANGE, ILL.

Monongahela ..... Feb. 2 mos. 170 170 541,913 1,222,879 1,063 2,323 548,326 1,234,450 51,649 113,501 55,767 119,886 771 1,516 176,992 369,793 289,463 613,156 52.8 49.7 258,863 621,294 65,252 132,037 110,911 304,051 134,348 262,285
* Debit
12, 1947

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF FEBRUARY AND TWO MONTHS OF CALENDAR YEAR 1947—CONTINUED

Name of road		Av. mileage operated during period	Operating revenues: Freight	Passenger	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures	Maintenance of Equipment	Traffic	Transportation	Total	Operating ratio	Net from railway operation	Railway tax-accruals	Net railway operating income 1947	Net railway operating income 1946
Montour	Feb.	51	$260,601	.....	$262,300	$16,737	$60,957	$959	$104,373	$192,070	73.2	$70,230	$55,336	$62,057	$36,023
	2 mos.	51	561,417	.....	565,166	35,173	127,572	2,059	214,881	397,896	70.4	167,270	114,480	130,773	94,074
Nashville, Chattanooga & St. Louis	Feb.	1,052	1,899,256	$181,149	2,305,156	301,948	468,819	92,281	1,037,997	2,005,723	87.0	299,433	156,698	117,806	333,815
	2 mos.	1,052	3,924,185	426,862	4,842,208	652,346	916,753	191,178	2,126,379	4,080,542	84.3	761,666	424,295	286,515	477,457
New York Central	Feb.	10,746	37,527,071	8,923,115	51,771,556	6,483,536	11,165,207	841,614	24,627,024	45,593,304	88.1	6,178,252	4,817,935	—888,743	544,250
	2 mos.	10,746	77,035,164	19,702,487	107,767,060	12,519,572	22,858,995	1,716,024	50,715,922	92,987,292	86.3	14,779,768	9,839,463	1,272,547	1,542,791
Pittsburgh & Lake Erie	Feb.	223	2,373,469	88,458	2,576,237	352,690	803,072	53,563	1,040,901	2,386,121	92.6	190,116	428,736	413,134	18,089
	2 mos.	223	5,147,257	177,673	5,544,733	726,217	1,698,393	112,132	2,165,628	4,981,327	89.8	563,406	913,761	849,737	192,669
New York, Chicago & St. Louis	Feb.	1,687	6,850,759	96,153	7,110,766	854,972	1,116,899	188,546	2,767,080	5,187,205	73.0	1,923,561	764,331	776,162	430,464
	2 mos.	1,687	14,021,167	242,558	14,600,668	1,785,469	2,279,058	367,035	5,472,668	10,431,746	71.5	4,168,922	1,645,324	1,727,749	1,007,941
New York, New Haven & Hartford	Feb.	1,838	6,414,550	3,997,071	11,514,672	1,824,557	1,814,625	245,275	5,300,238	10,037,920	87.2	1,476,752	1,000,000	—499,812	887,950
	2 mos.	1,838	13,331,916	8,479,650	24,200,960	3,601,355	3,774,240	477,956	11,019,794	20,688,108	85.5	3,512,852	1,975,000	—482,291	1,703,560
New York Connecting	Feb.	21	150,532	.....	162,049	52,595	13,537	.....	66,257	134,766	83.2	27,283	55,909	—10,393	97,527
	2 mos.	21	325,719	.....	352,640	97,800	40,937	.....	140,037	283,518	80.4	69,122	121,732	24,520	232,936
New York, Ontario & Western	Feb.	547	580,348	1,976	639,264	97,902	105,465	25,514	323,522	579,469	90.6	59,795	48,213	—71,869	—106,484
	2 mos.	547	1,179,635	4,236	1,297,140	194,603	217,600	51,061	676,088	1,193,270	92.0	103,870	98,162	—153,920	—215,544
New York, Susquehanna & Western	Feb.	120	248,902	39,538	313,890	38,337	40,734	4,976	135,961	238,179	75.9	75,711	35,671	14,952	—8,462
	2 mos.	120	501,578	81,598	627,527	80,464	78,921	9,689	284,302	491,730	78.4	135,797	71,767	11,412	20,417
Norfolk & Western	Feb.	2,130	11,511,673	490,601	12,328,955	1,781,983	2,382,157	229,003	3,758,912	8,542,062	69.3	3,786,893	2,336,819	2,378,458	2,733,187
	2 mos.	2,130	24,446,769	1,133,926	26,295,323	3,390,895	5,028,260	437,462	7,736,047	17,393,117	66.1	8,902,206	5,125,944	5,392,260	5,910,227
Norfolk Southern	Feb.	727	677,569	3,587	700,658	155,163	79,369	40,347	262,559	572,935	81.8	127,723	51,984	30,003	45,612
	2 mos.	727	1,386,257	8,131	1,434,595	302,018	159,318	81,010	542,577	1,160,455	80.9	274,140	112,632	71,013	94,159
Northern Pacific	Feb.	6,921	8,977,303	512,363	10,270,023	1,896,697	2,097,998	195,950	3,800,160	8,536,90	83.1	1,733,117	1,210,877	1,139,253	684,022
	2 mos.	6,921	18,713,605	1,191,235	21,587,813	3,707,274	4,285,066	404,897	8,128,282	17,707,927	82.0	3,879,886	2,577,895	2,386,960	2,223,575
Northwestern Pacific	Feb.	331	461,369	6,100	482,024	116,145	58,665	3,649	214,416	406,028	84.2	75,996	34,637	12,211	—150,660
	2 mos.	331	976,970	16,519	1,027,850	224,552	127,957	7,147	444,894	826,400	80.4	201,450	72,605	66,786	—315,523
Oklahoma City-Ada-Atoka	Feb.	132	60,141	.....	61,727	9,484	4,140	1,178	20,827	38,575	62.5	23,152	7,273	8,379	11,989
	2 mos.	132	144,591	.....	148,237	27,162	203	2,230	45,575	81,268	54.8	66,969	21,015	24,822	29,642
Pennsylvania	Feb.	10,116	47,642,791	11,982,003	64,776,600	6,949,705	15,649,096	1,110,633	34,583,119	61,129,731	94.4	3,646,869	6,164,532	—3,372,715	1,586,653
	2 mos.	10,116	99,309,770	26,515,372	136,758,493	14,123,436	32,426,381	2,185,565	70,416,268	124,999,549	91.4	11,758,944	12,534,242	—2,784,417	960,892
Long Island	Feb.	376	1,142,541	1,891,470	3,241,493	600,605	583,104	12,847	1,961,383	3,229,386	99.6	12,107	464,859	—770,738	—344,836
	2 mos.	376	2,136,497	3,915,343	6,510,616	1,069,877	1,204,974	67,518	3,989,827	6,483,048	99.6	27,568	939,146	—1,574,285	—660,517
Pennsylvania-Reading Seashore Lines	Feb.	389	401,099	209,220	636,235	193,188	132,313	7,502	478,319	834,030	131.1	—197,795	102,470	—402,676	—302,314
	2 mos.	390	850,010	442,901	1,348,019	381,240	261,252	17,095	993,954	1,702,426	126.3	—354,407	205,818	—772,016	—715,804
Pere Marquette	Feb.	1,950	4,487,857	184,349	4,898,447	709,648	832,466	107,979	2,112,199	4,002,068	81.7	896,379	373,979	282,298	182,855
	2 mos.	1,950	9,035,584	405,939	9,923,022	1,440,884	1,691,645	209,752	4,230,890	8,047,852	81.1	1,875,170	823,476	593,232	398,605
Pittsburg & Shawmut	Feb.	97	186,517	.....	187,429	17,719	33,629	1,919	57,492	118,807	63.4	68,622	6,812	53,480	36,677
	2 mos.	97	372,503	.....	375,222	38,366	61,307	4,163	115,895	235,269	62.7	139,953	13,552	108,411	76,436
Pittsburgh & West Virginia	Feb.	136	450,546	.....	469,696	71,854	109,222	32,940	123,493	367,659	78.3	102,037	59,329	78,257	5,434
	2 mos.	136	927,515	.....	966,430	150,725	214,651	65,715	251,554	743,224	76.9	223,206	126,988	166,777	23,836
Pittsburg, Shawmut & Northern	Feb.	122	69,680	.....	70,677	12,399	13,253	1,162	24,483	61,216	86.6	9,461	5,055	—2,605	—10,120
	2 mos.	122	137,822	.....	139,444	24,841	27,102	2,332	50,891	121,558	87.2	17,886	10,191	—6,197	—17,781
Reading	Feb.	1,358	7,670,780	569,325	8,722,586	1,259,247	1,787,490	105,974	3,526,739	6,925,816	79.4	1,796,770	957,188	808,618	680,948
	2 mos.	1,358	16,109,856	1,176,633	18,319,765	2,545,600	3,585,508	222,142	7,360,728	14,206,215	77.5	4,113,550	2,109,825	1,871,698	1,442,054
Richmond, Fredricksburg & Potomac	Feb.	118	1,119,445	620,264	1,937,123	198,452	269,237	16,143	823,565	1,433,758	74.0	503,365	253,151	174,676	410,394
	2 mos.	118	2,389,497	1,361,795	4,154,918	389,630	573,576	31,792	1,685,841	2,927,175	70.5	1,227,743	580,231	482,998	866,522
Rutland	Feb.	407	316,249	42,734	436,394	80,990	102,818	12,837	268,452	483,160	110.7	—46,766	37,936	—109,398	—55,585
	2 mos.	407	644,864	90,123	896,988	163,826	216,009	28,039	571,590	1,017,225	113.4	—120,237	76,642	—237,326	—111,033
St. Louis-San Francisco	Feb.	4,645	6,599,214	523,184	7,703,648	1,130,494	1,227,297	198,137	3,195,977	6,100,198	79.2	1,603,450	862,252	758,764	638,761
	2 mos.	1,358	16,109,856	1,176,633	18,319,765	2,311,250	2,829,062	399,785	6,674,582	12,934,350	81.6	2,910,326	1,647,239	1,325,451	1,418,259
St. Louis, San Francisco & Texas	Feb.	160	318,370	14,347	349,304	39,954	25,038	13,128	132,271	219,502	62.8	129,802	30,135	71,884	—24,446
	2 mos.	160	566,463	30,577	628,237	83,874	63,235	26,618	279,858	472,307	75.2	155,930	46,201	55,844	64,449

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF FEBRUARY AND TWO MONTHS OF CALENDAR YEAR 1947—CONTINUED

St. Louis-San Francisco	Feb.	4,645	6,599,214	523,184	7,703,648	1,130,494	1,227,297	198,137	3,195,577	12,934,350	81.6	2,910,326	1,647,239	1,325,451	1,418,259
	2 mos.	1,358	16,109,856	1,176,633	18,319,765	2,311,250	2,829,062	399,785	6,674,582	219,502	62.8	129,802	30,135	71,884	—24,446
St. Louis, San Francisco & Texas	Feb.	160	318,370	14,347	349,304	39,954	25,038	13,128	132,271	472,307	75.2	155,930	46,201	55,844	64,449
	2 mos.	160	566,463	30,577	628,237	83,874	63,235	26,618	279,858						

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF FEBRUARY AND TWO MONTHS OF CALENDAR YEAR 1947—CONTINUED

Name of road		Av. mileage operated during period	Operating revenues: Freight	Passenger	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures	Maintenance of Equipment	Traffic	Transportation	Total	Operating ratio	Net from railway operation	Railway tax accruals	Net railway operating income 1946	Net railway operating income 1945
St. Louis Southwestern Lines	Feb.	1,575	$3,790,798	$59,161	$3,977,155	$577,514	$427,023	$116,037	$1,183,316	$2,442,499	61.4	$1,534,656	$615,567	$753,382	$604,723
	2 mos.	1,575	7,704,019	141,875	8,112,494	1,099,772	837,134	236,117	2,465,750	4,925,973	60.7	3,186,521	1,293,279	1,587,624	943,490
Seaboard Air Line	Feb.	4,156	7,795,419	1,716,785	10,264,475	1,618,227	1,632,830	268,125	3,990,401	8,046,791	78.4	2,217,684	982,454	855,452	1,607,614
	2 mos.	4,156	16,180,121	3,665,263	21,366,886	3,110,831	3,450,436	540,804	8,293,381	16,488,886	77.2	4,878,000	1,983,354	2,000,616	3,342,025
Southern Railway	Feb.	6,484	15,106,975	1,734,946	17,956,555	2,660,723	3,080,870	332,284	6,891,653	13,645,616	76.0	4,310,939	2,025,690	1,878,853	2,491,632
	2 mos.	6,484	30,885,376	3,808,801	37,025,940	5,475,071	6,662,534	649,988	14,292,407	28,503,067	77.0	8,522,873	3,984,455	3,650,175	5,148,322
Alabama Great Southern	Feb.	316	1,018,500	126,359	1,222,519	168,390	295,045	28,926	451,002	995,184	81.4	227,335	157,721	108,191	103,387
	2 mos.	316	2,138,246	317,718	2,617,607	373,904	617,993	57,809	946,218	2,101,358	80.3	516,249	340,952	242,675	206,984
Cinn., New Orleans & Texas Pacific	Feb.	337	2,258,811	280,262	2,679,852	320,130	567,659	52,924	870,682	1,914,973	71.5	764,879	436,009	405,456	359,855
	2 mos.	337	4,578,247	555,810	5,425,732	629,031	1,157,480	95,205	1,743,679	3,833,235	70.6	1,592,497	883,340	860,779	662,223
Georgia Southern & Florida	Feb.	397	345,474	70,286	460,996	99,891	54,289	6,920	192,791	373,148	80.9	87,848	34,666	17,595	64,811
	2 mos.	397	722,512	170,011	984,834	202,402	108,091	13,717	400,904	764,876	77.7	219,958	83,360	68,515	122,476
New Orleans & Northeastern	Feb.	204	675,448	57,168	778,909	117,672	95,471	20,054	240,872	508,372	65.3	270,537	125,496	108,596	94,422
	2 mos.	204	1,418,198	127,103	1,640,805	238,371	203,161	38,017	487,665	1,036,297	63.2	604,508	272,253	251,363	199,460
Southern Pacific	Feb.	8,228	25,052,201	4,170,128	31,456,317	3,868,315	5,319,328	598,130	11,980,399	23,683,903	75.3	7,772,414	3,805,283	2,924,761	1,447,239
	2 mos.	8,228	51,511,513	8,569,867	64,939,829	7,698,122	11,242,851	1,223,041	25,573,767	49,701,299	76.5	15,238,530	7,339,983	5,578,488	4,420,466
Texas & New Orleans	Feb.	4,320	7,422,153	798,804	8,800,871	1,126,062	1,074,126	176,140	3,125,920	5,925,207	67.3	2,875,664	1,242,951	1,211,654	1,125,139
	2 mos.	4,320	14,470,139	1,845,242	17,530,249	2,329,194	2,140,238	364,284	6,569,553	12,284,746	70.1	5,245,503	2,301,424	2,097,200	2,553,610
Spokane, Portland & Seattle	Feb.	944	1,334,386	45,983	1,485,481	342,414	233,577	15,705	577,671	1,241,656	83.6	243,795	147,865	—25,091	105,518
	2 mos.	944	2,953,335	106,411	3,281,583	649,111	427,445	33,677	1,238,505	2,502,823	76.3	778,760	309,276	214,602	67,827
Tennessee Central	Feb.	286	299,048	7,397	328,141	42,294	62,289	9,326	151,334	280,903	85.6	47,238	30,501	—5,509	—13,278
	2 mos.	286	629,348	16,180	687,503	117,611	140,405	18,943	303,052	611,175	88.9	76,328	61,825	—27,243	—42,442
Texas & Pacific	Feb.	1,873	3,490,137	411,546	4,280,752	591,453	618,271	140,786	1,616,753	3,226,939	75.4	1,053,813	317,580	541,703	803,610
	2 mos.	1,873	7,008,527	949,311	8,776,559	1,241,434	1,280,524	285,367	3,348,319	6,710,429	76.5	2,066,130	645,628	1,073,145	1,592,624
Texas Mexican	Feb.	162	182,121	139	202,668	30,595	34,774	4,845	51,809	134,711	66.5	67,957	17,990	35,253	29,728
	2 mos.	162	356,544	222	405,585	56,507	55,761	9,081	106,158	251,812	62.1	153,773	36,363	88,422	64,664
Toledo, Peoria & Western	Feb.	.....	.....	.....	.....	.....	.....	.....	.....	.....	...	.....	.....	.....	.....
	2 mos.	.....	.....	.....	.....	.....	.....	.....	.....	.....	...	.....	.....	.....	.....
Union Pacific System	Feb.	9,775	24,030,170	3,035,947	29,189,711	3,310,262	4,915,762	617,372	10,612,543	21,168,992	72.5	8,020,719	4,170,452	2,979,011	3,878,293
	2 mos.	9,775	48,967,814	6,875,919	60,602,620	6,951,300	10,042,424	1,295,799	22,412,646	44,252,427	73.0	16,350,193	8,395,687	6,029,499	7,753,454
Utah	Feb.	111	209,369	.....	209,390	24,753	48,390	519	73,187	153,324	73.2	56,066	27,453	24,539	17,071
	2 mos.	111	423,572	.....	423,634	55,355	92,422	1,204	150,654	312,834	73.8	110,800	55,865	51,471	33,976
Virginian	Feb.	661	2,738,749	4,786	2,840,633	281,177	630,017	34,258	708,027	1,719,069	60.5	1,121,564	549,500	691,801	628,323
	2 mos.	661	5,963,307	10,248	6,162,207	561,528	1,271,755	69,317	1,394,777	3,434,764	55.7	2,727,443	1,273,500	1,674,962	1,278,389
Wabash	Feb.	2,393	6,423,236	418,489	7,305,456	839,347	942,846	208,932	2,900,820	5,063,797	69.3	2,241,659	852,556	1,011,072	745,654
	2 mos.	2,393	12,974,859	887,975	14,832,474	1,694,494	2,025,783	417,940	5,845,958	10,446,192	70.4	4,386,282	1,714,524	1,922,270	1,360,014
Ann Arbor	Feb.	294	620,496	2,942	635,171	68,910	114,839	19,964	280,570	491,123	77.3	144,048	67,112	62,232	35,577
	2 mos.	294	1,209,608	7,072	1,237,284	132,100	233,064	40,133	553,064	980,325	79.2	256,959	124,502	112,582	68,626
Western Maryland	Feb.	837	2,947,416	14,698	3,092,410	383,976	545,365	58,613	1,107,100	2,203,799	71.3	888,611	398,000	480,546	440,221
	2 mos.	837	6,173,339	30,546	6,473,371	773,334	1,128,096	121,457	2,212,144	4,465,878	69.0	2,007,493	908,000	1,123,093	1,014,121
Western Pacific	Feb.	1,195	2,492,326	118,130	2,686,547	478,714	518,471	114,519	1,161,853	2,417,988	90.0	268,559	199,798	—50,177	483,193
	2 mos.	1,195	5,165,477	311,031	5,643,039	967,901	1,137,231	238,000	2,318,497	4,970,048	88.1	672,991	425,517	83,844	1,161,444
Wheeling & Lake Erie	Feb.	505	1,920,726	2	1,981,744	191,454	333,089	52,762	662,517	1,296,407	65.4	685,337	409,659	457,081	131,750
	2 mos.	505	4,009,548	2	4,133,543	404,521	687,008	107,188	1,341,394	2,654,565	64.2	1,478,978	869,845	986,680	448,172
Wisconsin Central	Feb.	1,051	1,757,123	31,437	1,858,897	207,876	319,624	44,956	900,031	1,539,115	82.8	319,782	138,479	69,255	101,445
	2 mos.	1,051	3,496,227	72,319	3,781,094	434,607	629,622	92,689	1,777,232	3,072,884	81.3	708,210	281,998	231,396	267,164

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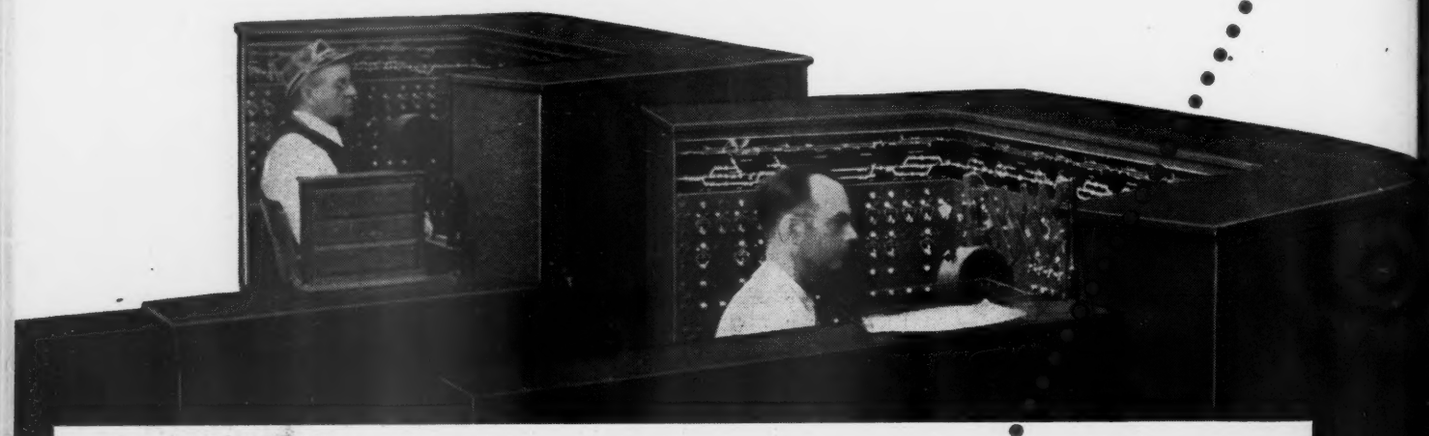
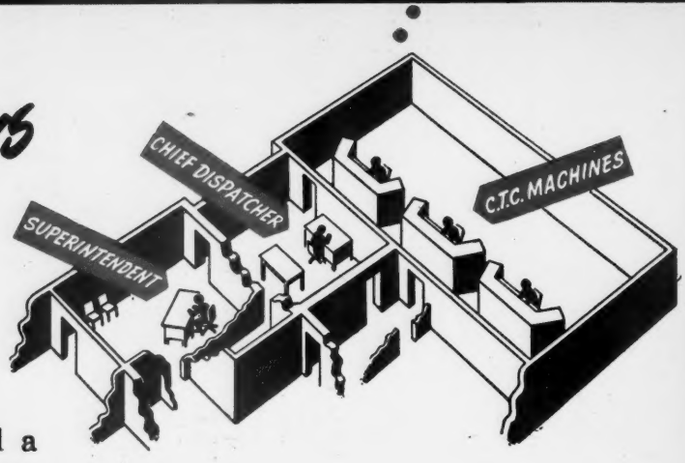


... at Division Headquarters



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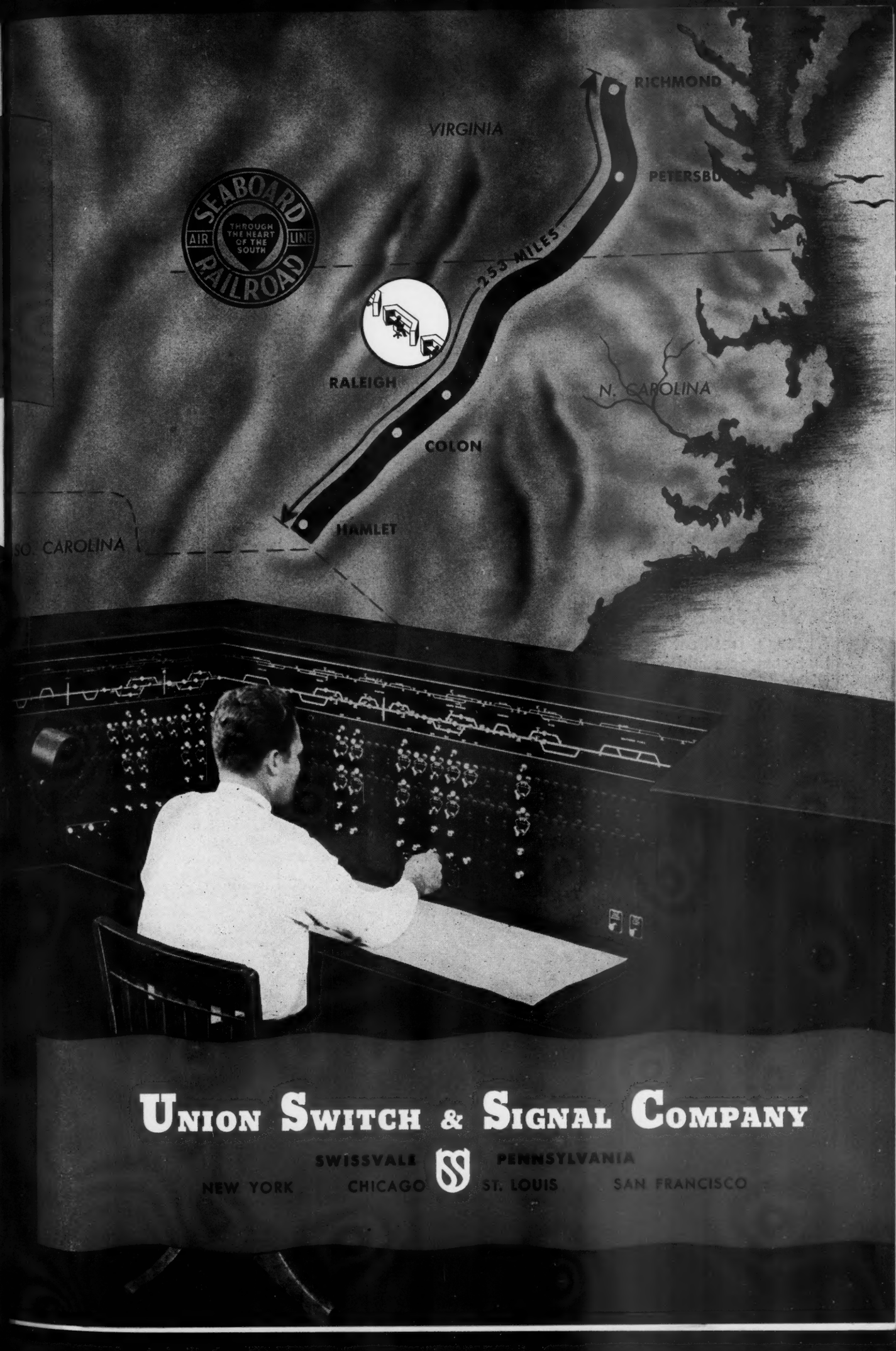

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Sees 1947 Capital Expenditures Above 1946

(*Continued from page 755*)

below the 1939-1941 level in this respect. The New York Central was in third position in five of the combined indices.

"As between coach and first-class business . . . the Baltimore & Ohio showed the greatest relative improvement in total passengers carried and in total passenger revenue for coach and first-class business taken separately as well as combined. For the remaining four indices there were considerable variations among the four roads in leadership as between the two types of business. In coach business the Pennsylvania showed the greatest relative increase in passenger-miles, the New York Central in miles per passenger and revenue per passenger, and the Baltimore & Ohio in revenue per passenger-mile. For the parlor and sleeping-car traffic, the Baltimore & Ohio showed the greatest relative gain in passenger-miles. The Pennsylvania made the best record in miles per passenger and revenue per passenger and the New York Central ranked first in revenue per passenger-mile."

The figures presented with respect to the 1946 distribution of freight cars indicate that roads in the Eastern and Western districts had a slightly greater proportion of the average number of freight cars on line than of cars owned, the Eastern-district ownership having been 43.81 per cent of the total and its average number on line, 44.76 per cent. Respective figures for the Western district were 34.34 per cent and 36.98 per cent. Meanwhile the Pocahontas lines, with a 1946 ownership of 8.32 per cent of the total cars had an average of 5.42 per cent on line, while the respective figures for the Southern region were 13.53 per cent and 12.84 per cent.

The bureau pointed out that although the Eastern-district roads had 44.76 per cent of the cars on their lines, the car-miles produced in that district last year were only 35.05 per cent of the total for all districts. The Western-district roads, with 36.98 per cent of the total cars on line, produced 44.72 per cent of the car-miles. "However, the average haul per revenue ton of freight per road in 1946 was 172 miles in the East and 312 miles in the West," the "Comment" added.

It went on to compare the number of cars on line and cars owned per million car-miles. Those figures showed that the Eastern-district roads had 82.4 cars on line and 72.8 cars owned per million car-miles (loaded and empty) as compared with 53.4 and 44.7 cars, respectively, for roads in the West, or an excess of cars on line over cars owned of 9.6 in the East and 8.7 in the West. In the Southern region the excess on this basis was 2.9 cars while the Pocahontas region was in the reverse position, showing an excess of 22.3 in owned cars over cars on line.

Another article presented data on the compensation of railroad employees for the years 1939-1946. Those figures showed that the average straight-time compensation per hour (excluding executives, general officers and assistants) rose 52.3 per cent between 1939 and 1946—from 72.1 cents to $1.098. The latter was also 19.9 per cent above the comparable 1945 figure of 91.6 cents.

"The total payroll of the carriers," the bureau also pointed out, "reached an all-time high of $4,170 million in 1946, which was 54.67 per cent of the total operating revenues. Similar percentages for the seven preceding years ranged from a low of 38.88 in 1943 to 46.64 in 1939. Although the 1946 payroll was $310 million above that of 1945, total operating revenues in the latter year declined $1,271 million."

The February revenue figures show that the freight revenue for that month on a daily basis was 4.2 per cent above

* * *

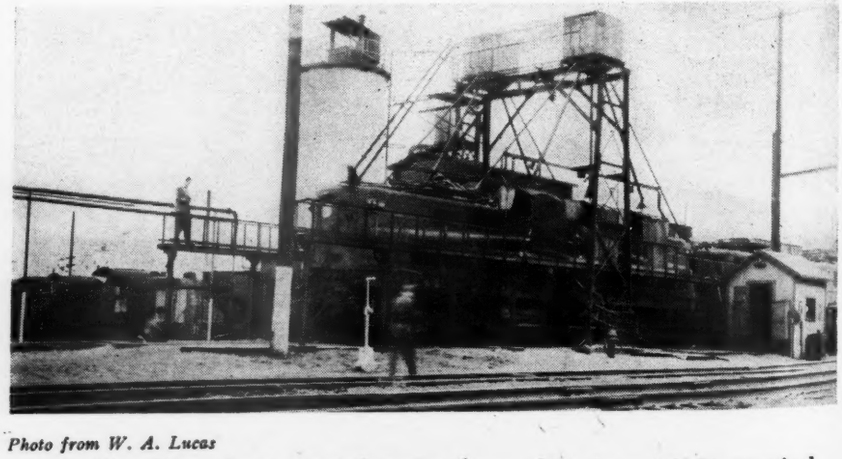

Photo from W. A. Lucas

Servicing Pennsylvania electric locomotives at Meadows (N. J.) terminal

January and 23.1 per cent above February, 1946. Passenger revenues were down 5 per cent from the previous month and 38.3 per cent below February, 1946. The February freight revenue index (based on the 1935-1939 monthly average as 100) was 213.9, compared with January's 205.2 and February, 1946's 173.7. The passenger revenue index was 223.7, "the lowest since May, 1942"; it compared with January's 235.4 and February, 1946's 362.4.

The net railway operating income for the 12 months ended with February was put at $604,017,000 and the net income at $280,004,000. These compare, respectively, with $814,618,000 and $415,689,000 for the 12 months ended with February, 1946; and with $1,085,195,000 and $652,631,000 for the 12 months ended with February, 1945.

Switching and Terminal Lines

Pointing out that the bureau does not regularly publish any summary which shows by type of agency the ownership or control of switching and terminal companies, the "Comment" presented selected data from the reports of such companies. The figures showed that of the 239 switching and terminal companies which reported to the commission in 1945 only 38 were Class I companies, 103 were Class II, 72 were Class III, and 26 were lessor or proprietary companies.

"Steam railways (almost entirely Class I line-haul roads) owned or controlled 150 switching and terminal companies, which in turn owned 69.2 per cent of all track mileage owned by such companies," the bureau continued. "These 150 companies operated 73.2 per cent of the total track mileage operated by all switching and terminal companies. Industrial concerns, principally steel corporations, owned or controlled 60 switching and terminal companies which accounted for 22.5 per cent of the mileage owned and 19.8 per cent of the mileage operated. Municipalities and the federal government owned 10 companies and 19 were independently owned. Together these two groups account for 8.3 per cent of the owned mileage and 7 per cent of the mileage operated by all switching and terminal companies.

"Switching service only was performed by 97 companies, 57 performed terminal service only, 66 provided both switching and terminal services, 7 were bridge and ferry companies, and 12 combined line-haul service in addition to switching and terminal services. The 1945 railway operating revenues of all switching and terminal companies combined totaled $148.6 million, and the net income amounted to $8.7 million. Investments in railway property slightly exceeded $1 billion."

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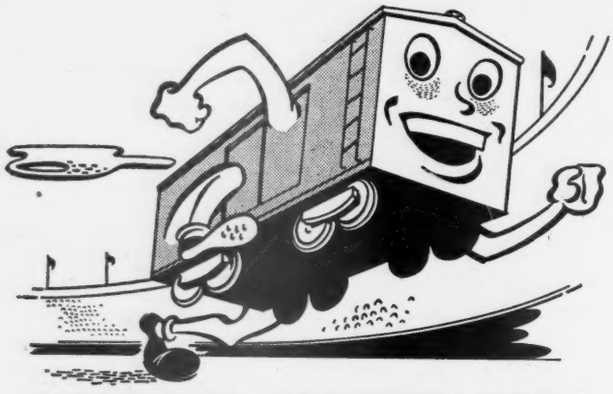

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